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REPORT

FOR THE YEAR 1957

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REPORT

OF THE

Commissioner of Public Health

for the year 1957

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The Honourable Emil Nulsen, M.L.A.,

MINISTER FOR HEALTH

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Sir,

I have the honour to submit the Report of the Department of Public Health for the Year 1957.

LINLEY HENZELL, M.D. (London), B.Sc., D.P.H.,
Commissioner of Public Health.

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DEPARTMENT OF PUBLIC HEALTH

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Report of the Commissioner

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TO THE HONOURABLE THE MINISTER FOR HEALTH :

I have the honour to submit the report of the Department of Public Health for the year 1957.

During the year the population increased from 677,317 to 691,723, a total increase of 2·13 per cent.

The birth rate remained high at 24·47 per thousand of mean population and has thus remained approximately stationary since the end of the war.

The death rate was 7·66 per thousand of mean population—the lowest on record and also the lowest for the year of all Australian States.

The natural increase in population (excess births over deaths) was thus 11,627, representing a percentage increase of 1·68, which is higher than the world average of 1·6 per cent.

This high natural increase associated with a high standard of living and social conditions shows a virility and vitality that augur well for the future.

The maternal mortality rate was 0·65 per thousand live births—a figure still too high.

The infant mortality rate was 21·09 per thousand live births.

It will thus be seen that these basic vital statistics are generally satisfactory.

STATE HEALTH COUNCIL

During the year 1957, the State Health Council met three times. There were two meetings each of the Hospital Requirements Committee and the Maternal and Infant Health Committee, and one meeting of the Mental Health Committee.

Early in the year, the Hon. Minister for Health, approved of the reconstitution of the State Health Council. At 31st December, 1957, it comprised the following personnel :—

One senior representative of the Royal College of Physicians—Dr. Ernest R. Beech.

One senior representative of the Royal College of Surgeons—Mr. Norman Robinson.

One senior representative of the Royal College of Obstetricians and Gynaecologists—Dr. Roland Nattrass.

Four Medical practitioners, nominated by the British Medical Association (at least one to represent country districts)—Dr. Dixie M. Clement, Dr. H. Leigh Cook, Dr. Ian O. Thorburn, Dr. Martin F. Williams.

Three representatives of the Faculty of Medicine of the University of Western Australia—Professor Gordon King, Professor C. W. D. Lewis, Professor Eric G. Saint.

Inspector-General of Mental Services—Dr. E. J. T. Thompson.

The Commissioner of Public Health—Dr. Linley Henzell.

The Deputy Commissioner of Public Health—Dr. W. S. Davidson.

The Under Secretary—Mr. J. J. Devereux.

The Hon. Minister also agreed that the period of appointment of the Council should be for three years instead of one as previously.

Among matters dealt with by the Council during the year were :—

Hospital Construction.—A committee comprising Dr. Davidson, Dr. Colebatch, Dr. Bedbrook and Mr. Griffith, was appointed to consider the planning of the Rehabilitation Hospital at the Infectious Diseases Hospital, Subiaco.

Cardiological Clinics in Metropolitan Hospitals.—The State Health Council co-ordinated arrangements between the major metropolitan hospitals for the appointment of a committee consisting of representatives of the Royal Perth Hospital, Fremantle Hospital and the Princess Margaret Hospital, to advise the Boards of Management of these hospitals on matters concerning the establishment and equipping of cardiological clinics in this State.

Post-Mortem Examination of Deaths in Childbirth.—The Council recommended that post-mortem examinations in cases of deaths in childbirth were most desirable and should be made compulsory, provided that all post-mortems were performed by a nominated pathologist. The Crown Law Department has acted on this advice where practicable.

Midwifery Regulations.—The Council recommended that the Midwives' Regulations be examined with a view to amending them to conform with present requirements.

Psychiatry.—The Council viewed with considerable concern the shortage of psychiatrists in the Mental Health Service and strongly supported the Department's recommendation for the appointment of additional psychiatrists.

Medical Appliances, Patent Medicines and Drugs Advertised for Sale.—The Council resolved that—

(a) consideration be given to requiring a declaration of contents on the label of bottles or packages of patent medicines and drugs ;

(b) power be sought to ban the sale when drugs or medicines were found to be not in accordance with the claims in any advertisement label regarding therapeutic value or where the sale was considered detrimental to health.

The implementing of these recommendations is under consideration.

Hospital Priorities.—The Council recommended the following priorities for hospital construction in the metropolitan area :—

1. King Edward Memorial Hospital—additions.
2. Extension of accommodation for chronic and aged sick at " Sunset " and other institutions and thus release beds in the major metropolitan hospitals.
3. Provision of nurses' quarters at the Royal Perth Hospital.
4. Establishment of the Rehabilitation Hospital at West Subiaco. The construction of units of suburban peripheral hospitals at Scarborough and Midland Junction.

Concurrently with the above, planning and construction should proceed with the new mental hospital and the planning of the general hospital on University land at Hollywood.

General Hospital, Hollywood.—The Council recommended that the Senate of the University be requested to nominate two members to serve on a special committee, with two nominees of the State Health Council and the Principal Architect to consider planning of the General Hospital on University land at Hollywood, such committee to advise the Minister through the State Health Council, and the University Senate.

Traffic Accidents.—The Council approved of a resolution that Dr. Davidson, Professor Lewis and the Commissioner of Police, or his deputy, should meet and discuss the possibility of undertaking research on road accidents in Western Australia.

Tranquilizing Drugs and Antibiotics.—The State Health Council approved of a recommendation by the Pharmaceutical Council that a number of tranquilizing drugs and antibiotics be included in the Tenth Schedule of the Pharmacy and Poisons Act. The Council also agreed that regulations under the Pharmacy and Poisons Act should be amended to prescribe that Carbromal and Bromvaletone may be sold only when labelled as follows :—

" This preparation should be used only under medical directions."

LOCAL AUTHORITIES

The problems associated with the boundaries of some local authorities in the metropolitan area have not yet been solved.

In the meanwhile, investigations are being carried out by this Department into the problems of rubbish disposal and the reclamation of otherwise waste land in and around Perth. The local authorities are showing considerable interest and it is proposed next year to prepare a plan for a regional system of disposal.

FOOD AND INSPECTORIAL STAFF

Mr. C. E. Flower, Chief Inspector (General), in his report, Appendix XVIII, outlines briefly some aspects of the volume of work which is done by the Health Inspector staff. This work is carried on under conditions of some difficulty. The staff is insufficient in number to cope with the demands made upon it by local health authorities and members of the public, and to perform adequately its proper functions under the Health Act.

It is considered that more inspectors on the staff would enable the staff to undertake more comprehensive work than is now possible.

HEALTH OF THE NATIVE POPULATION

Particular attention is drawn to Dr. Davidson's report on the health of natives—Appendix X.

Great publicity has been given to alleged malnutrition of bush natives in the central area. Experience of medical officers over the years has shown that the native in his natural state was, on the whole, not prone to deficiency diseases even though his lot could be hard in years when game was affected by poor seasons.

Publicity concerning the so-called poor condition of desert natives takes no account of the fact that the real native problem concerns the aboriginal after he has come into close contact with the white population. The conditions under which the native lives in and near townships in the Kimberleys and throughout the South-West are such that a grave social and public health problem is created. Excessive attention to the bush native merely draws attention away from the real problem.

These conclusions are supported by certain comments made by Dr. Davidson in his report.

PUBLIC HEALTH LABORATORIES

The transfer of the bacteriological work of the Royal Perth Hospital from the Public Health Laboratory to the hospital's own laboratory in the course of the year made possible much greater attention to the Department's own microbiological requirements.

These new developments have been outlined by Dr. Kovacs, Bacteriologist, in his annual report (Appendix II).

Whereas in 1956 the number of examinations carried out for the Royal Perth Hospital was 31,276, this had declined in 1957 to 3,149. At the same time, the number of examinations conducted for the Department of Public Health had increased from 14,714 to 19,578. Relieved of the pressure of the hospital's requirements, it has been possible in the course of the year for the Department's laboratories to begin the development of their proper function. It may be anticipated that this tendency will increasingly progress in future years.

Dr. Kovacs has been able to give special attention to investigations into the Salmonellae, particularly in connection with egg pulp. Certain problems associated with the sterilization of the latter had been investigated. This is a matter of considerable economic importance because of the State's export of egg pulp.

Results of the culture of blood-and-bone meal, used both as cattle meal and as fertilizer, have shown a high percentage of contamination with Salmonellae. There is inter-State traffic in this product and the implications of this contamination are being closely followed up.

Similarly, work with coconut continues and Salmonellae were found in 25 per cent. of the samples examined. One isolation of S. paratyphi-B was of great significance. Experiments were commenced into the sterilization of coconut.

With the greater resources available, more attention was given to routine examination of sewage and water supplies, and this programme will continue.

Considerable progress was made with the development of a media of increased sensitivity to the growth of myco-bacterium tuberculosis.

Dr. Kovacs' report contains much that is of interest concerning technical aspects, particularly with the development of more sensitive media and techniques in general.

As in former years, the work of Mr. Drummond, the Technical Officer, Serological Section, is of a high standard. In the course of the year he carried out a total of 24,608 serological examinations, of which 5,306 were performed for the Royal Perth Hospital.

On 1st October, 1957, the Bunbury branch of the Public Health Laboratories was opened at the District Hospital, Bunbury. Dr. L. Szaloky was placed in charge and in the remainder of the year there were indications that this branch laboratory was filling a long felt need.

The co-operation of the medical practitioners in Bunbury has been complete and satisfactory.

It is pleasing to note the assistance given to Dr. Szaloky by the hospital staff.

Continued experience shows that there is urgent need for the laboratories to leave the precincts of the Royal Perth Hospital where the space occupied by them is badly needed for hospital purposes and the Department's work is incapable of expansion. This should be possible when the new Chest Hospital is opened next year.

A further great need is the provision of proper premises for the Virus Diagnostic Laboratory. Professor Stanley has inaugurated this in very cramped and limited quarters, and it is likely that this position will be improved next year. Because of its isolation, it is essential for this State to conduct its own virus diagnostic service.

TUBERCULOSIS CONTROL BRANCH

As Dr. Alan King, Director of the Tuberculosis Control Branch, remarks in his report (Appendix III), the tuberculosis death rate remains very low. The figures for the last eight years are :—

	Death Rate per 100,000	
	Pulmonary	All Forms
1950	22·4	22·9
1951	13·1	14·1
1952	12·5	13·6
1953	6·9	7·4
1954	8·9	9·5
1955	4·7	5·0
1956	6·3	6·8
1957	5·2	5·3

In comparison with other countries where similar measures have been taken to control the disease, this low death rate is very satisfactory and it is doubtful if it will be possible to reduce it much further in the near future. However, it is essential to persevere with our efforts in order to maintain this low figure.

It is significant that as a result of our control measures, there are no notifications of the disease at all in the age group 5 to 15 years, and the majority of female patients were in the 30 to 40 age group.

The names of 287 persons were removed from the register as controlled or " cured ".

In the course of the year 144,801 microfilms were taken, 90,321 in the metropolitan area and 54,480 in the country. The total number of microfilms taken since 1948 is 732,022.

Once more, the case finding programme has yielded cases of disease other than tuberculosis. In the survey of the metropolitan area which commenced in August 1954, apart from 285 persons suffering from active tuberculosis, there were a further 275 suspects and, in addition, 65 cases with cancer of the lung and 2,892 other abnormalities. Thus, mass radiography of the chest is a most important public health measure and a valuable weapon in preventive medicine for reasons other than the control of tuberculosis.

Proper care is taken to see that there is no undue exposure of the persons examined to radiation, and it may be stated that mass radiography of the chest as carried out in this State does not present a significant contribution to the exposure of the population to radiation hazards.

A careful watch has been maintained on the incidence of the disease among migrants. As a result of this watch and of the attention which is being paid to this problem by the Commonwealth Departments of Health and Immigration, Dr. King states that " there is no undue prevalence of tuberculosis in migrants."

In the course of the year the Artificial Pneumothorax Clinic closed, the last attendance being on 19th July. Thus an era in the treatment of pulmonary tuberculosis has passed, this former method having been quite replaced by the use of antibiotics and chemotherapy, associated with more radical surgical measures in selected cases.

Early in the year Dr. McNulty was appointed to conduct the Chest Clinic attached to the Kalgoorlie District Hospital. He is tackling with energy the problem of complicated silicosis. Silico-tuberculosis in gold miners and ex-gold miners remains a major public health problem.

Dr. Heymanson, Tuberculosis Physician, was away for most of the year on post-graduate study leave. In his absence, Dr. F. G. B. Edwards was acting Tuberculosis Physician and carried out the duties ably—see Appendix IV for his report.

In his report, Appendix V, Dr. Elphick, the Medical Superintendent of Wooroloo Sanatorium, draws attention to the fact that there has been a diminution of the number of cases readmitted because of relapse of the disease. This is encouraging, and shows that treatment is now resulting in more permanent control of the disease.

Rehabilitation is progressing satisfactorily at Linley Valley Colony and at the Federal Box Factory, which is now in new premises in West Perth.

COMMUNICABLE DISEASES

See the report of the Director of Epidemiology, Dr. Snow—Appendix VII.

The year 1957 was notable for the achievement of what appears to be the control of poliomyelitis. In addition, the incidence of diphtheria has been reduced to the lowest ever recorded in this State.

The poliomyelitis immunisation campaign which commenced in July, 1956, was continued throughout the year, using mobile units as well as certain fixed units in Perth. As a result of this great activity, together with the co-operation of the public, on December 31st, 1957, 251,966 persons out of a total estimated population of 691,723 had received either two or three injections of Salk vaccine and could be regarded as being substantially immunised. Of this number, almost 200,000 were under the age of 15 years. The acceptance rate in the child population was practically complete. This achievement is one of the most remarkable in the history of preventive medicine in this State.

This immunisation of a large proportion of the population immediately bore fruit in a reduction in the prevalence of poliomyelitis. As Dr. Snow points out, since 1948 when there was a major epidemic with 311 cases, in the course of the next five years the average number of cases reported was 59. In 1954 there were 436 cases ; in 1955, 33, and until the 30th June, 1956, there were 400. Salk vaccine immunisation commenced on 2nd July, 1956, and the remainder of the year there were seven cases notified provisionally, of which only two were finally accepted as being due to poliomyelitis. In 1957 there were only three cases of established poliomyelitis reported. None of these five cases which occurred since the beginning of the immunisation with Salk vaccine had been immunised. There were no cases of the disease among persons who had been immunised.

As a result of these highly successful efforts, next year it is proposed to make the vaccine available to adults.

Congratulations should be given to Dr. Snow and his team of workers on this outstanding work and, also, to the public because of its wholehearted co-operation. Acknowledgment should be made also to the activities of the Health Education Council for its efforts to achieve the high acceptance rate which occurred.

Diphtheria.

Dr. Snow draws attention to the fact that as it had been recommended that all children be immunised against diphtheria before receiving Salk vaccine, there had been a large increase in the number of children receiving diphtheria immunisation.

As a result, there has been a fall in the occurrence of diphtheria and a new low record was established. There is no reason why, with public co-operation, this position should not be maintained.

Influenza.

The anticipated epidemic of Asian influenza arrived in the State in July and ultimately became widespread. It is impossible to give accurate information concerning the number of persons affected, but there were 18 deaths, most of these being caused by staphylococcal pneumonia.

Professor Neville Stanley, Professor of Microbiology in the University of Western Australia and Consultant to this Department, succeeded in isolating the virus—the first time that a virus has been isolated by workers in this State. It had not previously been possible to do any virus diagnostic work in this State.

Although about 5,000 doses of Commonwealth Serum Laboratory's Influenza Virus Vaccine were distributed by the State Government, the results of its use, particularly in hospital staffs were disappointing.

One result of this influenza virus was that the Department was able to make arrangements for the immediate creation of an emergency hospital at the Claremont Show Grounds. This proposal was worked out in detail and there can be no doubt that if there had been a heavy morbidity from influenza and its complications, the position could have been handled from the hospital point of view by implementing the planned arrangements. This plan has not been overlooked and is being held in reserve.

Dr. Snow pays tribute to the assistance obtained from the Public Health Laboratories in investigation and control of the bacterial diseases. With the establishment of a Virus Diagnostic Laboratory, the work of this Department in communicable diseases will be increased in efficiency.

VENEREAL DISEASES

Dr. Debney's report (Appendix VIII) indicates that there has been a diminution in the clinic notifications of gonorrhoea by 20 per cent. in comparison with the previous year's figure. New cases of syphilis reported are also low.

However, these figures must be accepted with due reserve as there can be no doubt that appreciable numbers of the population continue to be infected and are not reported to this Department, but receive adequate treatment privately. The true extent of the occurrence of these two venereal diseases is difficult to determine.

LIBRARY

Mr. Woolcott's report (Appendix XII) indicates the general position concerning the Department's library service.

Considerable attention has been paid to the development of this service over a number of years and one can say that now, under the care of Mr. Woolcott, it has reached a high level of efficiency and that it is of great assistance to the staff of this Department.

In addition, it has established a close working partnership with other libraries in the State, particularly the Medical Library and the Department of Agriculture Library.

Mr. Woolcott makes a special mention of the assistance we have received from the Librarian of the Barr-Smith Library, Adelaide, whose co-operation has been all that could be desired.

A well equipped library service is one of the most important weapons in the hands of a public health department and Mr. Woolcott is to be congratulated on the quality of the service which he has built up.

He draws attention to the extremely limited accommodation which is available to the library now. It is impossible to use the room in which it is housed as a reading room and all references by members of the staff to journals and other publications entail the taking out of the library of the appropriate journal or book. This involves more recording work on the part of the librarian and is most inconvenient. One of the most urgent needs of this Department at the present is the provision of enlarged accommodation for the library.

STAFF PUBLICATIONS

Mr. Woolcott, the Librarian, has prepared abstracts of contributions to the literature by authors associated with this Department during the year—see Appendix XIII.

Members of the staff are encouraged to make such contributions and to do the work which will facilitate these.

Dr. Davidson has made a further contribution on the Diagnosis of Leprosy, which has been of assistance to medical men in this State. He also records a remarkable case of lead poisoning in a family at Port Hedland.

An important series of contributions in the year were those by Dr. Davidson, Dr. Pitney, Mr. Davis and Professor Mann on observations made into the health and clinical findings among the aborigines of the Warburton Ranges. These reports will well repay study by those interested in the condition of aborigines in Central Australia.

Further work has been done on a follow-up of aborigines in the State who had been vaccinated with B.C.G. These reports by Drs. Edwards, Harris and Slade yielded interesting results.

Professor Mann continued her publications in the aspects of trachoma in this country.

MATERNAL HEALTH

In the course of the year 11 women died in child birth or of complications associated with child birth or pregnancy. There were 16,924 live births and the maternal death rate was 0·65 per thousand live births. (Appendix XXIV.)

This figure has been approximately stationary since the year 1953. In spite of the good medical and hospital services available in this State, it is higher than in some other countries of comparable economic and social standards. Greater attention is needed to prevent some of these avoidable deaths.

This matter has been referred to Professor Gordon King, Professor of Obstetrics and Gynaecology in the University of Western Australia and Consultant to this Department, and it is anticipated that enquiries will be held into this problem next year.

INFANT HEALTH

Dr. Elizabeth Gibson reports on the Infant Health Services—Appendix XIV.

The infant mortality rate declined to 21·09 per thousand live births.

The Infant Health Service continues to perform sterling work and is much appreciated by the public.

In the course of the year over 26,000 individual babies attended the centres throughout the State, the total attendances being 217,728.

A total of 22,627 home vists were made by Sisters ; 328 mothers were advised by letter and there were 5,674 advices by telephone.

There has been a further increase in the number of centres in the State, 11 being added in the course of the year. It is pleasing to record the happy co-operation that exists between the State Government, the Lotteries Commission, the Local Health Authorities and Local Committees in providing the capital cost for these buildings.

The Correspondence Service continues to do remarkably good work. In the course of the year Sister Philbin made trips throughout the Murchison, Kimberleys and the North-West and established personal contacts with those mothers with whom she had been corresponding.

The work of the Correspondence Section is indispensable in our outback areas.

In addition, a correspondence course in Mothercraft has been instituted and this is particularly valuable in the case of aboriginal girls. The co-operation of the Education Department is acknowledged in the conducting of Mothercraft lectures in State schools.

Successful lectures have also been held in parentcraft in West Perth and in Fremantle.

In the course of the year, six Sisters were granted scholarships to attend a full time 12-weeks course in the health of the pre-school child. This extension of the activities of the section to include the pre-school age group is of great importance.

Dr. Eksteins is now undertaking the medical examination of children in kindergartens.

The Infant Health Service on the Trans-Australia Railway has been continued by carrying out the regular routine trips on the " Tea and Sugar " Train. The Sisters now also do immunising procedures in the course of these visits, which are highly appreciated.

The Infant Health Service has over the years been productive in its results and has contributed to the substantial reduction in the infant mortality rate which, in our own State, is one of the lowest in the world. With its increasing attention to the health of the pre-school child, it may be anticipated that these beneficial results will continue in the future.

SCHOOL MEDICAL SERVICE

The report prepared by Dr. Davidson (Appendix XV) gives a summary of the work of the School Medical Officers.

Note should be made of the need to provide adequate sanitation in the form of septic tank systems in those schools where an adequate water supply is assured.

REPORT OF THE CONSULTANT OPHTHALMOLOGIST

In her report, Appendix XVI, the Consultant Ophthalmologist, Professor Ida Mann, draws attention to the encouraging progress which is being made in the control of trachoma in schools and in missions and the native population. This work is to continue.

Her work in connection with the partially sighted children is also encouraging.

SCHOOL DENTAL SERVICE

In his report, Appendix XVII, the Senior Dental Officer, Mr. McKenna, comments that for the first time since the staff establishment was fixed at 14 some years ago it was possible for the Department to commence the year with a full complement, namely 14. This staff was maintained throughout the year.

Although the school population has doubled since the establishment of 14 was fixed, this establishment has not been increased. Of course, the staff is quite inadequate to cope with the dental needs of the school children of this State.

Mr. McKenna makes mention of some enquiries which have been carried out by the staff in the course of the year concerning the diet and personal history of those children who have been found to have sound teeth. His comments are interesting and will repay study.

NURSING BRANCH

Miss Lee, the Principal Matron, returned from her overseas visit in September.

As a result of this, she prepared a comprehensive report concerning the various nursing conditions and methods observed by her in all parts of the world. Already this report has proved to be of great value to the Department and she is to be congratulated on the thoroughness with which it was undertaken.

In her annual report (Appendix XIX) she mentions that at the end of the year there were 30 Bursary students undergoing training as nurses and that within two years this group should be trained and able to undertake duties as staff nurses. One of the conditions of the bursary is that the student, after the completion of her training, serves for 12 months as a staff nurse—six months of this being at her training school and the other six months in a country hospital.

This should improve to some extent the difficult nursing conditions in country hospitals.

All efforts continue to be made to improve the recruitment of both trained nurses, trainee nurses and nursing aides to staff country hospitals.

The position remains very difficult and the community as a whole is indebted to those nurses who continue to work in country hospitals and enable the hospital services to be carried on.

NURSES' REGISTRATION BOARD

See Appendix XX.

PHOTOGRAPHIC SECTION

Mr. Plummer's report, Appendix XXI, outlines briefly the scope of the work of the Photographic Section of the Department.

This work is increasing in volume and scope and the Department is fortunate in that the work is technically of such a high standard.

It is anticipated that there will be continued developments in this field.

HEALTH EDUCATION

In his short report, Appendix XXII, Mr. Carr, Executive Officer of the Health Education Council of Western Australia, outlines some of the activities of this Council, which, in the short period since its formation, has proved the value of such an organisation.

Particular attention is drawn to the Corrigin Project for the prevention of home accidents, which had quite remarkable success.

CONCLUSION

As in previous years, the assistance and co-operation of all members of the staff have been of a high order. Finally, Sir, heavy burdens have been greatly relieved by your never-failing understanding and encouragement.

LINLEY HENZELL, M.D. (London), B.Sc., D.P.H.,
Commissioner of Public Health.

Appendix I

VITAL STATISTICS FOR WESTERN AUSTRALIA

——	1955	1956	1957
Mean Population—			
Males	339,137	348,853	355,518
Females	319,610	328,482	336,205
Total	658,747	677,317	691,723
Births—			
Males	8,436	8,870	8,738
Females	8,187	8,046	8,186
Total	16,623	16,916	16,924
Birth rate per 1,000 of mean population	25·23	24·98	24·47
Deaths—			
Males	3,106	3,265	3,126
Females	2,273	2,307	2,171
Total	5,379	5,572	5,297
Death rate—rate per 1,000 of mean population	8·17	8·23	7·66
Natural increase rate per 1,000 of mean population	17·06	16·75	16·81
Infant Mortality per *1,000 births—			
Metropolitan area	22·50	17·87	19·39
Rest of State	22·37	27·82	22·83
Whole State	22·44	22·70	21·09
Stillbirths—			
Metropolitan	114	111	117
Whole State	239	226	245

* Excluding Stillbirths.

Comparison of Infant Mortality and General Death Rate.

Place.	Infant Mortality			General Death Rate		
	1955	1956	1957	1955	1956	1957
New Zealand (*a*)	20·09	19·39	20·00	8·95	9·00	9·29
Western Australia	22·44	22·70	21·09	8·17	8·23	7·66
New South Wales	24·86	23·47	22·70	9·32	9·58	9·20
Victoria	18·37	19·32	20·16	8·92	9·17	9·03
Queensland	20·28	22·74	21·62	8·44	8·92	8·39
Tasmania	23·37	20·98	20·15	7·87	7·80	8·09
South Australia	23·20	19·88	20·63	9·19	8·95	8·67

(*a*) Non-Maori.

Appendix II

PUBLIC HEALTH LABORATORIES

To the Commissioner of Public Health.

As a result of the separation of the Public Health Laboratories from the Royal Perth Hospital an extensive programme into the bacteriological aspect of preventive medicine was inaugurated, as contrasted with previous years when diagnostic clinical work was the predominant function of the Laboratories. Although a proportionate amount of clinical bacteriology was still performed, chiefly for the diagnosis of diphtheria (cases and carriers), tuberculosis, venereal diseases, as well as general clinical bacteriology for metropolitan and country areas, the main emphasis was laid on other branches of medical bacteriology.

An intensive study into the chemotherapeutic qualities of local plant extracts was undertaken ; the number of water and foodstuff examinations were increased ; comparative tests for water examination with membrane filter and MPN methods were carried out with the object of using the simpler membrane filter for routine examinations. New sources of food-poisoning bacteria were found ; investigations were made into the sterilisation of vehicles which commonly carry salmonella bacteria, and which can serve as a source of enteric infections. The number of bacteriological sewage examinations was increased and a constant bacteriological control of the eggpulp industry was introduced.

During October the first country *Branch Laboratory* of the Public Health Laboratories was opened in the *Bunbury* District Hospital. The inauguration of this laboratory was the first major step towards providing the country areas with prompt and efficient local laboratory services.

To give a clearer picture of this programme the special features of our work have been dealt with in detail under the following headings :—

1. Clinical bacteriology.
2. Sterilisation of antibiotic discs with Ethylene oxide.
3. Antibiotic rods.
4. Staphylococcus sensitivity.
5. Diphtheria.
6. Ps. pyocyanea.
7. Tuberculosis.
8. Meningitis, Blood culture, Shigella.
9. Salmonella.
    - Polytrope Medium.
    - Salmonella Confirmation Medium.
    - Micro-indol Test.
    - KCN Test.
10. Eggpulp.
11. Coconut.
12. Organic fertilisers and " meat- and fish-meal."
13. Sterility test medium.
14. Plant extracts.
15. Serology.
16. Bunbury Branch Laboratories.

Clinical Bacteriology.—At the end of 1956 the Department of Microbiology of the Royal Perth Hospital started to function and, as a result, most of the clinical bacteriological work for the Hospital, which was previously done by the Public Health Laboratories was taken over by the Department of Microbiology. The Laboratories of the Department of Public Health, however, continued to carry out certain items for the Hospital, such as Diphtheria, Tuberculosis, water and milk examinations. This division of the work has made it difficult to compare the work performed by the Laboratories in 1957 with the figures for the previous year. In the first place it has naturally resulted in a large decrease in investigations in general bacteriology carried out for the hospital, i.e. 27,943 (96·58 per cent.). This figure does not include M. tuberculosis. However, this decrease was partly offset by a considerable increase, 4,912 (49·32 per cent.) in the tests performed for general practitioners and the clinical and general public health work undertaken for the Department of Public Health. It might also be pointed out that, though there was a slight decrease in the M. tuberculosis figures for the Royal Perth Hospital, 184 (7·85 per cent.) the increase mentioned above reduced the overall decrease during the year to approximately 50 per cent. (See Tables 1, 2 and 3 on the following page.)

Table 1

Statistics of Bacteriology Laboratories

	1956			1957		
	R.P.H.	D.P.H.	Total.	R.P.H.	D.P.H.	Total.
Bacteriology without M. tuberculosis and M. leprae	28,931	9,939	38,870	988	14,851	15,839
M. tuberculosis and M. leprae	2,345	4,775	7,120	2,161	4,727	6,888
Bacteriology—Total	31,276	14,714	45,990	3,149	19,578	22,727

Table 2

Monthly Distribution of Examinations

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total 1957	Total 1956	Increase or Decrease per cent.
General Bacteriology:															
R. P. Hospital	151	40	45	71	116	115	136	47	120	74	17	56	988	28,931	—27,943 = —96·58%
P. H. Department	1,462	1,391	1,434	1,106	1,207	1,150	1,167	1,199	1,042	1,289	1,221	1,183	14,851	9,939	+ 4,912 = +49·32%
M. tuberculosis and M. leprae:															
R. P. Hospital	168	156	171	167	158	232	203	151	195	196	184	180	2,161	2,345	— 184 = — 7·85%
P. H. Department	322	320	448	320	475	348	405	417	464	347	422	439	4,727	4,775	— 48 = — 1·00%
Total	2,103	1,907	2,098	1,664	1,956	1,845	1,911	1,814	1,821	1,906	1,844	1,858	22,727	45,990	—23,263 = —50·50%

Table 3

Distribution of Specimens

Examinations	R.P.H.	P.H.D.	Total
Bacteriology—			
Animal Inoculations (excluding Tb noculations)	....	140	140
Blood Cultures	....	34	34
Brucella Cultures	....	16	16
Burn Swabs	....	24	24
Casoni	....	1	1
C.S.F.—(a) culture	....	56	56
(b) micro	....	80	80
(c) biochemical	....	6	6
Dark Ground Examinations	....	6	6
Ear and Eye Swabs Culture	....	51	51
Fluids, serous cavities—(a) culture	....	27	27
(b) micro	....	25	25
Faeces—(a) culture	....	160	160
(b) micro	....	27	27
Fungi examinations	....	7	7
Gonococci—(a) smears	....	2,689	2,689
(b) cultures	....	350	350
K.L.B., Swabs for	944	2,101	3,045
Other throat swabs—not K.L.B.—(a) culture	....	115	115
(b) micro	....	36	36
Leptospira—culture	....	2	2
Pus cultures	....	309	309
Sensitivity Tests	....	2,754	2,754
Sputa—(a) culture	....	72	72
(b) micro	....	65	65
Urine—(a) culture	....	334	334
(b) micro	....	411	411
(c) general	....	59	59
Vaccines	....	81	81
Vaginal swabs—(a) culture	....	102	102
(b) micro	....	102	102
Wound swabs	....	10	10
Miscellaneous	....	68	68
M. tuberculosis (including animal inoculations)	2,157	4,676	6,833
M. leprae	4	51	55
Milk	44	10	54
Frozen foods—eggpulp	....	388	388
Miscellaneous—(a) oysters	....	257	257
(b) coconut	....	35	35
(c) general	....	39	39
Rat Survey	....	42	42
Sterility Tests	....	2	2
Water—(a) drinking	....	2,378	2,378
(b) river	....	548	548
(c) sewerage	....	166	166
(d) Moore swabs	....	521	521
(e) miscellaneous	....	3	3
Blood films—malaria	....	3	3
Faeces—(a) amoebae	....	42	42
(b) worms or ova	....	23	23
Vaginal smears for Trichomonas	....	74	74
Total	3,149	19,578	22,727

Antibiotic rods sterilised with Ethylene oxide

The drying of antibiotic discs under sterile conditions has the disadvantage of requiring special apparatus or, when it is done in closed petri dishes, the drying takes a longer time in which the antibiotic may deteriorate. The antibiotic discs are prepared in our laboratory under semi-sterile conditions, then dried quickly in open containers at 37° C. and sterilised in ethylene oxide gas. For sterilisation, the dried discs are collected in 4 oz. specimen jars with screw caps. A short Wassermann tube which has been kept in a freezer is placed in each jar and, using a cooled pipette, it is filled with 0·5 ml. ice-cold ethylene oxide. The cap is immediately screwed on tightly and the jar kept for 6 hours at room temperature. After six hours contact, the screw-cap is removed and the jar loosely covered with several layers of sterile gauze, and kept at room temperature overnight while the ethylene oxide evaporates.

Experiments have shown that the antibiotic discs can be replaced by short *absorbent paper rods,* 11 mm. long and 1·5 mm. wide, which were originally prepared from paper " Dental points " by cutting off the tips. The rods are dyed with I.C.I. aniline dyes of Bowie and Gould. For dyeing and impregnation small 2 in. petri dishes are filled with closely packed, upright rods. About 660 rods will fill a small petri dish. Nine ml. of a watery solution of the antibiotics is used to impregnate the contents of one dish. The impregnated rods are removed and quickly dried in flat layers in large petri dishes at 37° C. and finally sterilised by ethylene oxide.

After the inoculation of the sensitivity plates, the rods are inserted vertically into the agar layer with small pointed forceps, and the results read in the same way as the discs. The advantage of the rods is that they have a diameter of only 1·5 mm. against 6 mm. or more of the ordinary discs and therefore more tests can be done on one plate or, if necessary, the thin rods can be placed further apart than the discs.

The deterioration in Streptomycin solutions through ethylene oxide sterilisation, previously commented on by Kaye, Irminger and Phillips, (Jl. Lab. & Clin. Med. 1952, Vol. 40), was not observed in our dried Streptomycin discs or rods.

Staphylococcus

The sensitivity of 334 Staphylococcus aureus haemolyticus strains isolated from patients of private practitioners is shown on the following table :—

Antibiotic or Chemotherapeutic	Concentration per disc	Sensitive per cent.
Penicillin	1 unit	27·2
Penicillin	10 unit	34·4
Streptomycin	10 mcg.	92·4
Chlorotetracycline	30 mcg.	93·4
Oxytetracycline	30 mcg.	90·7
Tetracycline	30 mcg.	91·0
Chloramphenicol	30 mcg.	100·0
Erythromycin	10 mcg.	100·0
Bacitracin	10 units	100·0
Sulphadiazine	0·25 mg.	30·5

In contrast to " Hospital staphylococci " which generally show a marked resistance to Penicillin the sensitivity of the strains from Public Health material remained as high as in the previous year.

Staphylococcus aureus was diagnosed in an outbreak of food poisoning where this bacterium was cultured from the vomitus in three cases.

Furunculosis.—In a survey of cases where private practitioners asked for the preparation of vaccines, nasal swabs were requested. Fifty per cent. of the patients harboured Staphylococci in their nares with identical sensitivities to those cultured from the boils.

Diphtheria

From 1,786 cases (patients and carriers) 3,180 examinations were performed.

	No.	Per cent.
Number of examinations using either Loeffler slope, tellurite plate or modified Schroer enrichment medium	3,180	
Number of positive examinations	106	3·3
Number of positives using Loeffler slope, tellurite plate and modified Schroer enrichment medium *simultaneously*	91	
Positive on Loeffler, tellurite plate and modified Schroer enrichment medium	36	39·56
Positive on Loeffler and tellurite, negative modified Schroer enrichment medium	1	1·1
Positive on Loeffler and Schroer, negative tellurite	2	2·19
Positive on tellurite and Schroer, negative Loeffler	22	24·18
Positive on Loeffler, negative tellurite and Schroer	2	2·19
Positive on tellurite, negative Loeffler and Schroer	8	8·8
Positive on Schroer, negative Loeffler and tellurite	20	21·9
Positive specimens inoculated on Loeffler slope only	11	
Positive specimen inoculated on tellurite and Loeffler	1	
Positive specimens inoculated on Schroer only	3	

The typing and virulence test of 50 strains (from patients and carriers) were performed with the following results :—

Type	Virulent No.	Virulent Per cent.	Avirulent No.	Avirulent Per cent.
gravis	12	24	0	
mitis	32	64	6	12
intermedius	0	....	0	....
Total	44	88	6	12

The following methods were used for typing C. diphtheriae :—

(a) *Haematin-tellurite v-l-cystine plates* prepared from thrice *washed* sheep erythrocytes. The removal of the serum allows characteristic growth of the different diphtheria types which is more pronounced on this plate than on the chocolate medium by Anderson, Happold, McLeod and Thomson.

The Haematin plate (Kovacs : Med. Klinik, 1934, No. 48) was improved by employing autoclaved Diphtheria broth (see below) and meat infusion agar as a base and by the use of potassium tellurite for the preservation of the haematin suspension which can be stored.

The characteristics of the C. diphtheriae types on the haematin plate are as follows :

Gravis : large, flat colonies, dry, matt, friable when touched with the loop.
Mitis : raised, smooth colonies about 2–3 mm. in diameter.
Intermedius : very fine, flat colonies.

(b) With *carbohydrates :* glucose, starch and sucrose in an *autoclaved* Hiss base. The autoclaved medium will give the same result, as the customary repeated heating at 100° C. Ox serum is diluted 1 : 4 with freshly distilled water and 0·1 per cent. Difco agar, 0·1 per cent. Proteose peptone No. 3, bromcresol purple and Andrade's indicators added. The reaction is adjusted to pH 7·4 and the medium is boiled. Exact amounts of 2·5 ml. are filled into 1 oz. McCartney bottles to obtain *shallow layers* and then sterilised for 10 minutes at 5 lb. pressure. The shallow layer is essential. Before use the Seitz filtered carbohydrates are added.

(c) Further, the differentiation of gravis and mitis types was done in *Diphtheriae broth,* which is a modification of the base introduced by Schroer. The formula of this broth is as follows :

Meat infusion	1,000 ml.
Proteose peptone (Difco)	60 gms.
NaCl	10 gms.

adjust pH : 7·6
Steam for 10 minutes.
Filter through filter paper and add :

Glycerol	8 ml.
25 per cent. sodium acetate	5 ml.

The broth is filled into ¾ in. x 6 in. test tubes and autoclaved at 5 lb. for 10 minutes.

Before inoculation one capillary drop of sterile liquid *paraffin* is added to the tube. Type gravis forms, with paraffin, a heavy pellicle which is kept afloat. The mitis and intermedius types will grow with diffuse turbidity.

Ps. pyocyanea

The screening of the Pseudomonas strains was done with the *Oxidase* test, the simplicity and usefulness of which has been confirmed in several laboratories. The confirmation test was performed on Simmon's citrate agar, by haemolysis on horse blood agar plates, gelatine liquefaction and by acid formation from glucose.

The acid formation from glucose should be especially mentioned, as according to the new (seventh) edition of Bergey's " Manual of Determinative Bacteriology " Ps. pyocyanea does not produce acid from glucose.

We tested several hundreds of Ps. pyocyanea strains and it was found that all the strains will produce acid in the absence of peptone. Originally we used Hiss base for the fermentation, but a few strains failed to utilise glucose in this medium. Two media finally gave us satisfaction :

(a) The synthetic medium of Carlquist (Jl. of Bact., 1956, V. 71, p. 339) and

(b) the Simon medium (Brit. Jl. Exper. Path., 1956, V. 37, p. 494) with phenol red indicator and 2 per cent. glucose. For routine work we are now using the simpler Simon medium made from peptone-free 1 : 20 dilution of meat infusion filled to 2·0 ml. volumes into 1 oz. McCartney bottles to obtain *shallow layers* which allow the strains to utilise glucose within 24 hours. The screw caps of the bottles are replaced by cotton stoppers before incubation.

Mycobacterium tuberculosis

The volume and distribution of the work can be seen in Table No. 4.

Two Loewenstein-Jensen, two Blood-agar medium and one tube of Kirschner medium with 0·1 per cent. agar and 25 U/ml. Penicillin were employed for culture.

From 2,291 specimens cultured 165 strains of Mycobacterium tuberculosis (7·2 per cent.) and 13 strains of acid-fast saprophytes (0·6 per cent.) were obtained.

Two strains of *bovine type* of M. tuberculosis were cultured, one from sputum and one from urine. The blood medium was very helpful in their detection. Bovine tubercle bacilli grows on the blood medium in flat, glossy colonies. It should be mentioned that the bovine strain thrives in the primary culture quite well on the blood medium although 0·9 per cent. glycerol is used, as against the 0·75 per cent. glycerol in the Loewenstein-Jensen medium on which they grow mostly in fine smooth colonies or do not grow at all.

To reduce the risk of bacterial aerosols produced during the processing, the alkalinised specimen was shaken, incubated and centrifuged without opening the bottle and, after decanting the supernatant, the sediment only was neutralised.

The method for concentrating specimens in our laboratories is as follows :

1. Distribute about 10 ml. of specimen into a wide-neck 1 oz. McCartney bottle.
2. Flame neck of the bottle carefully—turning the bottle at the same time—to dry and disinfect the mouth.
3. Add to the specimen from a sterile burette with double hoods equal parts of sterile 4 per cent. NaOH with 2 per cent. Rappaport-Rosenkopf indicator.* (A. J. Clin. Path., 1948, V. 18, p. 579).
4. Shake in a bench type paint shaker for 5 *minutes.* (Am. Rev. Tb., 1954, Vol. 70, p. 176.)
5. Incubate in *water bath* at 37° C. for 10 *minutes.*
6. Centrifuge for 20 *minutes* at 2,500 r.p.m.
7. *Stand* at room temperature for 5 *minutes.*
8. Pour off supernatant fluid with sterile *decanting rod* into 5 per cent. phenol solution leaving about 1·5 mls. sediment in the container. Wipe the mouth of the bottle with the sterile cotton sleeve of the decanting rod.
9. Flame the neck of the bottle carefully—turning the bottle at the same time—to dry and disinfect the mouth.
10. Close bottle with a *new sterile cap.*
11. Neutralise the sediment with sterile 12 per cent. HCl from a burette with double hood.
12. Add to the sediment 100 units of freshly prepared Penicillin in two drops of fluid from a short burette with hood.
13. Inoculate media with inoculating pipette : a capillary pipette with bent tip, and prepare slides and inject guinea pigs when indicated.

In 1957 the culture results with *blood medium* were not as good as in the previous year. An exact reason for this cannot be given, although the higher contamination rate on this medium could partly explain the divergence. At the end of 1957 and at the time when this report was written, the results with Loewenstein-Jensen and blood medium were at least equivalent, although the quicker growth on the blood medium was an advantage. (See Table No. 5.)

The *Kirschner* medium with 0·1 per cent. purified agar and 25 unit/ml. Penicillin proved a most useful medium for the primary culture of tuberculous specimens.

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* RAPPAPORT-ROSENKOPF INDICATOR

Methyl red	10 mg.
Thymol blue	70 mg.
N/10 NaOH	100 ml.

To 1,000 ml. of 4 per cent. NaOH add 20 ml. of the indicator solution. Sterilise 30 minutes in steam

Table No. 4

Number and Distribution of Examinations for M. Tuberculosis

Specimen	Direct Smears *or* Centrifuged Deposit			Centrifuged Deposit after Homogenisation			Cultures			Guinea Pig Direct Inoculation			Virulence Test			Total Examinations		
	D.P.H.	R.P.H.	Total	D.P.H.	R.P.H.	Total	D.P.H.	R.P.H.	Total	D.P.H.	R.P.H.	Total	D.P.H.	R.P.H.	Total	D.P.H.	R.P.H.	Total
Sputum	1,484	570	2,054	720	247	967	719	247	966	19	35	54	41	6	47	2,983	1,105	4,088
Gastric Contents	....	....	....	51	20	71	596	128	724	234	46	280	37	16	53	918	210	1,128
Laryngeal Swabs	....	....	....	185	....	185	185	....	185	78	....	78	4	....	4	452	....	452
Pleural Fluids	....	....	....	4	34	38	4	34	38	4	34	38	....	....	....	12	102	114
C.S.F.	....	12	12	4	18	22	4	21	25	4	19	23	....	1	1	12	71	83
Urines	....	....	....	82	187	269	81	187	268	51	121	172	4	1	5	218	496	714
Other specimens	3	1	4	26	57	83	28	57	85	22	55	77	2	3	5	81	173	254
Total	1,487	583	2,070	1,072	563	1,635	1,617	674	2,291	412	310	722	88	27	115	4,676	2,157	6,833

Number of Specimens : D.P.H. = 3,118, R.P.H. = 1,241. Total : 4,359.
Number of Guinea Pigs used : D.P.H. = 496, R.P.H. = 333. Total : 829. (From these 107 were used for virulence test.)
Number of Rabbits used : D.P.H. = 4, R.P.H. = 4. Total : 8. (All used for virulence test.)
Further, 42 smears were done for the diagnosis of *M. leprae* for the D.P.H. and four for R.P.H., which give 46 smears altogether.

Table No. 5

Comparison of Culture results of 159 positive specimens on Solid Media

Loewenstein-Jensen pos. Blood Medium pos.		Loewenstein-Jensen pos. Blood Medium neg.		Loewenstein-Jensen neg. Blood Medium pos.	
No.	Per cent.	No.	Per cent.	No.	Per cent.
102	64·1	34	21·4	23	14·5

Table No. 6

Comparison of Culture results of 133 positive specimens on Solid and Fluid Media

Loewenstein-Jensen pos. Blood Medium pos. Kirschner pos.		Loewenstein-Jensen *or* Blood Medium pos. Kirschner pos.		Loewenstein-Jensen and/or Blood Medium pos. Kirschner neg.		Kirschner pos. Blood Medium neg. Loewenstein-Jensen neg.		Loewenstein-Jensen pos. Blood Medium neg. Kirschner neg.		Blood Medium pos. Loewenstein-Jensen neg. Kirschner neg.	
No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
67	50·3	15	11·2	47	35·5	4	3	17	12·8	13	9·8

The advantage of the Kirschner medium is not clearly apparent from our table (No. 6) as only one McCartney bottle with 5 ml. Kirschner medium was used for each specimen against four bottles of the solid media (two Loewenstein-Jensen and two blood media). As the uneven distribution of the positive tubes inoculated with the same homogenised specimen is well known, the negative results with the fluid medium can be easily explained. It should be mentioned, that 4·8 per cent. of the Kirschner tubes showed growth against 5 per cent. on Loewenstein-Jensen and 4·5 per cent. on Blood medium.

The good results in the fluid medium were achieved in spite of its higher contamination rate. Therefore it can be expected that, with proper digestion and decontamination of the specimens, the fluid medium may become a better medium for primary cultures, than the solid media.

Before concluding the analysis of the Kirschner medium it should be mentioned that after Knox drew attention to the toxicity of the agar on M. tuberculosis and introduced the low agar concentration in the tuberculosis media, we thought that the *purification of the agar* by freezing and thawing (see literature by Buzzard & Perrin, J. Lab. & Clin. Med., 1955, v. 46, p. 689) might improve the culture results. 0·1 per cent. agar (Difco) was chosen as with this concentration the medium is still sufficiently fluid to be mixed with the specimen and does not need pre-warming.

The comparison of the culture results and guinea pig inoculation can be seen from Table No. 7.

Table No. 7

Statistical analysis of 12,194 *tubes of different media showing growth and contamination rate on individual medium during the year of* 1957

Media	No. of tubes inoculated	M. tuberculosis Positive		Acid-fast Saprophytes		Contaminated	
		No.	Per cent.	No.	Per cent.	No.	Per cent.
Loewenstein-Jensen Medium	4,578	233	5·0	16	0·3	167	3·8
Blood Medium	4,598	207	4·5	20	0·4	223	4·8
Kirschner + 10 units of Penicillin	1,798	86	4·8	10	0·6	201	11·1
Besredka Medium	1,220	56	4·6	2	0·2	43	3·5
	12,194	582	4·8	48	0·4	634	5·2

The contamination rate would only be 3·5 per cent. if specimens where all the tubes were contaminated are excluded from the above statistics.

Table No. 8

Comparison of Culture Results and Guinea pig Inoculation

Specimens	Total	Cult. pos. G. pig pos.		Cult. pos. G. pig neg.		Cult. neg. G. pig pos.		Remarks
		No.	Per cent.	No.	Per cent.	No.	Per cent.	
Gastric contents and Laryngeal swabs	41	36	87·8	1	2·4	4	9·8	Separate culture is carried out on each specimen but one guinea pig only was used for 3 specimens of gastric contents and 2 specimens of laryngeal swabs of each patient.
Urine, sputum, pus, pleural fluid, bronchial aspiration, C.S.F., tissue	22	18	81·8	2	9·1	2	9·1	From each specimen cultured one guinea pig was inoculated.

Meningitis

One case each of Streptococcus haemolyticus, Group A meningitis, and one case of Diplococcus pneumoniae infection was diagnosed.

Blood Culture

Three positive cultures were obtained from blood : one each of Staphylococcus aureus, Streptococcus viridans and Salmonella typhi were isolated.

Shigella Infection

From 10 cases the following Shigella types were cultured :—

Shigella flexneri	9 cases.
Shigella sonnei	1 case.

Salmonellae

An endeavour was made to investigate the occurrence of salmonellae in man, animals, and in different vehicles. Five hundred and twenty-one Moore swabs were examined from reservoirs, river, ocean and sewage, and 11 salmonellae were isolated from the first two sources.

The number of food examinations was increased and our results on eggpulp and coconut can be seen later on in this report. Investigations into the occurrence of salmonellae in organic fertilisers and animal food were initiated.

The distribution of salmonella serotypes isolated in the Public Health Laboratories from 1955 to 1957 can be seen in Table No. 9.

Table No. 9

Distribution and numbers of salmonella types isolated in the Public Health Laboratories, Perth, W.A., from 1955 *to* 1957

Types	Human Sources				Other Sources					
	FAECES		BLOOD							
	Cases	No. of Specimens	Cases	No. of Specimens	Eggpulp	River and Ocean	Reservoir	Fertiliser	Coconnt	Total No. of strains
1955—										
S. paratyphi A	1	1	1	3	....	....	....	....	....	....
S. typhi murium	2	2	....	....	....	....	....	....	...	....
S. cholerae suis	....	....	1	1	....	....	....	....	...	
S. typhi	4	4	2	4	....	....	....	....	....	
S. anatum	1	1	....	....	....	....	....	....	....	16
1956—										
S. paratyphi A	1	1	....	....	....	....	....	....	....	
S. paratyphi B	1	1	1	2	....	....	....	....	....	
S. derby	....	....	....	....	....	1	....	....	....	
S. typhi murium	2	2	....	....	....	1	....	....	....	
S. bovis-morbificans	2	2	....	....	....	....	....	....	....	
S. typhi	4	10	1	2	....	....	....	....	....	
S. anatum or newington	1	1	....	....	....	....	....	....	....	
S. orion	....	....	....	....	1	....	....	....	....	
S. new brunswick	....	....	....	....	1	....	....	....	....	
S. poona	....	....	....	....	1	....	....	....	....	
S. adelaide	1	1	....	....	....	....	....	....	....	27
1957—										
S. paratyphi B	....	....	....	....	....	....	....	....	1	
S. san diego	....	....	....	....	....	....	....	1	....	
S. derby	....	....	....	....	7	....	....	1	....	
S. typhi murium	3	6	....	....	11	5	....	....	....	
S. edinburgh	....	....	....	....	....	....	....	....	2	
S. birkenhead	....	....	....	....	....	....	1	....	....	
S. montevideo	....	....	....	....	1	....	....	....	....	
S. oranienburg	....	....	....	....	27	1	....	2	....	
S. muenchen	1	1	....	....	1	....	....	....	....	
S. newport	3	3	....	....	1	....	....	....	....	
S. typhi	3	5	1	1	....	....	....	....	....	
S. berta	....	....	....	....	....	1	....	....	....	
S. pullorum	....	....	....	....	80	....	....	....	....	
S. butantan	....	....	....	....	....	....	....	....	5	
S. anatum	....	....	....	....	1	....	....	....	....	
S. nyborg	....	....	....	....	....	....	....	1	....	
S. give	1	5	....	....	2	....	....	....	....	
S. cambridge	....	....	....	....	....	3	....	....	....	
S. worthington	....	....	....	....	1	....	....	....	....	
New type tentative antigenic formula 38,y,en.	....	....	....	....	....	....	....	....	3	180

NOTE.—For the serological differentiation of the salmonella strains we are indebted to Dr. Nancy Atkinson, Head of the Salmonella Reference Laboratories, Adelaide, and Dr. G. N. Cooper, Chief Bacteriologist, Public Health Laboratory, Bacteriology Department, Melbourne.

One incidence of salmonella food poisoning is of interest : Raw mussels were eaten by a married couple and both simultaneously developed acute gastro-enteritis. S. give was isolated from five specimens of the husband's faeces, whereas from three specimens of the wife's excreta S. typhi murium was cultured. The area, Robb's Jetty, where the mussels were collected, was under bacteriological control at the time and we were able to culture a third serotype of salmonella, S. berta, from a Moore swab.

In the faeces and blood of the typhoid *cases* the following S. typhi phage types* were found : C, two E_1 and one strain which was untypable. The S. typhi culture from the blood was obtained from the clot of a specimen submitted for Widal reaction. For the isolation of the strain Watson's method with streptokinase in taurocholate broth was used.

It is unfortunate that we can not correlate our present salmonella findings in coconut, eggpulp or animal food and fertilisers with the distribution of salmonellae in man in Western Australia. Only a small percentage of the gastro-enteritis cases are bacteriologically examined and many of the enteric fever cases are also lost from our survey. The Public Health Laboratories are very interested in obtaining faecal specimens or vomitus from all gastro-enteritis cases for (non chargeable) bacteriological examination, and this would give more informative statistics on the occurrence of salmonellae in man than we are able to produce at present.

Eggpulp Examinations

Birds are probably the greatest reservoir of salmonellae and the contamination of eggs by salmonellae is known all over the world. Hens may be carriers of salmonellosis and may lay eggs containing salmonellae, but more often the contamination is derived by bacteria present in bird faeces penetrating the eggshell.

As eggs are used for human consumption mostly in a partially cooked and sometimes in a raw state, the salmonella bacteria in them are frequently ingested. This can be dangerous, especially for children who are very susceptible.

A total of 388 eggpulp specimens were examined, of which 128 (33 per cent.) showed salmonella bacteria. A high percentage of the infected eggpulps contained S. pullorum, i.e., 21·6 per cent. of the samples submitted. These results were most important as it had been generally accepted in agricultural circles that S. pullorum had little or no significance in Western Australia. In consequence of a report of the Public Health Laboratories the attention of the Department of Agriculture was drawn to our results.

Besides the high infection rate caused by S. pullorum in the eggpulp examined, S. oranienburg (6·9 per cent.), S. typhi murium (2·8 per cent.) and S. derby (1 per cent.) play an important part in our material. S. typhi murium was found in infertile eggs in Victoria and thus it is apparent that it can be passed by a carrier bird to its eggs.

Apart from the above-mentioned salmonellae, the following serotypes were cultured from eggpulp : S. newport, S. muenchen, S. anatum, S. give and S. worthington. Four eggpulp specimens contained two salmonella serotypes. S. pullorum was found thrice in combination with S. oranienburg, once with S. typhi murium and once with S. newport.

The following *method* was used for the examination of eggpulp :—

Polytrope Medium.

Salmonella confirmation medium.

From each specimen one S.S. (Difco) plate was directly inoculated and further the specimen was divided into two 25 ml. samples. These were enriched in 50 ml. double strength selenite medium after the addition of 25 ml. 1/4 strength Ringer solution. Subcultures were done after incubation for 24 and 72 hours to S.S. (Difco) and bismuth sulphite agar (Difco) plates, although at the beginning of the year McConkey plates were also used, but later discontinued. When possible at least five suspect colonies were transferred from each plate to *polytrope* medium, which allows the observation of lactose, sucrose, mannite and glucose fermentation, gas formation from the latter, further urea, H_2S and indol formation in a single 1 oz. McCartney bottle. Next morning the lactose-sucrose or urea positive strains were discarded. Similarly, the mannite and glucose negative bottles or mannite negative but glucose without gas positive bottles, as possible Pseudomonas, were removed. Finally all indol positive strains were rejected. The rest were subcultured on a "*Salmonella confirmation medium*" composed of Simmon's citrate slope, salicin and sorbitol peptone water in a single McCartney bottle, further to an agar slope and a KCN "bijou" bottle. On the following morning all salicin and KCN negative, sorbitol positive strains were agglutinated, first with polyvalent O and H salmonella sera.

As only a single bottle of "Polytrope" medium was used for the screening of salmonellae, it was only a question of organisation and experience for a relatively small staff to examine, when necessary 400–500 strains daily.

The 4 per cent. lactose-sucrose in the polytrope medium is prepared in a diluted autoclaved Hiss base with the addition of a very small amount of peptone and over 95 per cent. of the paracolon and many of the Bethesda strains ferment in the above carbohydrates after 24 hours incubation in this medium.

The lactose-sucrose is added to the Hiss base from a Seitz filtered 20 per cent. lactose-sucrose stock solution in freshly distilled water. It is essential that this stock solution, which corresponds to a 40 per cent. carbohydrate solution is filled to the neck of bottles closed with rubber stoppers or screw caps with rubber washers and kept refrigerated. The stock solution is checked before use for hydrolysis with *glucose oxidase paper* (Tes-Tape made by Eli Lilly & Co.) and should not be employed when traces of glucose are detected.

Microindol Test.

To exclude indol positive late lactose-sucrose positive strains a *micro-indol* method (J. Clin. Path., 1959, V. 12, p. 90) was developed. With a platinum *spiral loop* 0·08–0·09 of the medium was added to four drops of *Kovacs* indol reagent in a Kahn tube. When the indol reaction was not immediately apparent, the tube was heated over a Bunsen burner for one or two seconds only and the reaction observed.

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* For the phage typing of the S. typhi strains we are indebted to Dr. M. M. Wilson, Assistant Director, and Dr. G. N. Cooper, Chief Bacteriologist, Public Health Laboratories, Melbourne.

With the micromethod a great number of strains can be tested in a short time, especially when two or three spiral loops are used alternately.

KCN Test. The Braun-Moeller *KCN test* was simplified to avoid the complication of the paraffining of the cork stoppers. Instead of tubes, McCartney "*bijou bottles*" were aseptically filled with 1·5 ml. of the KCN medium, and, for storage in refrigerator, placed in wire racks to prevent bottles falling over and the medium staying in contact with the rubber washers. The bottles were kept in refrigerator for not longer than two weeks after their preparation. Moeller advises the use of 0·5 per cent. KCN stock solution for the preparation of the medium. We found that this concentration is not sufficiently stable and therefore we keep in a dark place, a 5 per cent. *KCN* stock solution which has to be diluted ten times before being added to the base. Our base was originally prepared with Bacto Peptone (Difco) with good results. As we can obtain the Danish Orthana Peptone, it is now used in our medium. To simplify the reading of bacterial growth by Bethesda cultures, we add 0·5 ml. steam sterilised 1 per cent. *triphenyl tetrazolium hydrochloride solution* to 200 ml. sterile KCN base. Through the bacterial growth, the tetrazolium hydrochloride is reduced to the corresponding formazan, a red water-insoluble compound. The *pink coloration* in the positive tubes is more pronounced and much easier to read than the turbidity caused by bacterial growth.

Desiccated Coconut

Thirty-five samples of coconut were examined and in nine samples salmonellae were found (25·7 per cent.). Eight samples were contaminated with one salmonella serotype : from one sample S. paratyphi B was cultured ; from two, salmonella strains with O antigen 38* and from five, S. butantan were isolated. One sample only was contaminated with *two* salmonella serotypes : S. edinburgh and a salmonella strain with O antigen 38* were grown from this specimen.

The occurrence of salmonellae in desiccated coconut is of great public health importance, although only a few instances of salmonella infections were connected with it. Attention should be drawn to the typhoid cases in 1953 in Canberra which were associated with infected coconut. In 1953 we found 37 specimens were contaminated, seven with S. nyborg and 30 with S. senftenberg.

Fortunately the minimal infective dose in many of the salmonellae for man by ingestion is in the region of a hundred thousand to several million bacteria and this also differs according to their type. For this reason we do not usually realise the importance of desiccated coconut as a vehicle for salmonella infections. The main danger lies in the possibility that other foodstuff, which may serve as a good medium for the multiplication of the pathogens, will be contaminated by the salmonellae in the coconut.

Concerning the infectivity of salmonellae it should be noted that S. typhi behaves differently to other salmonellae and a single bacterium may be sufficient to cause an infection in man.

Our isolation of *S. paratyphi B* should serve as a serious warning and should indicate the need for control and for the disinfection of all foodstuff which is produced under primitive hygienic conditions.

It should be mentioned that in spite of our findings there was no noticeable increase in enteric fever in Western Australia. However, as S. paratyphi B may cause gastro-enteritis only, bacteriological examinations would frequently not have been requested, thus several cases would have escaped notification.

We started wide-scale experiments on the *elimination of the pathogens* in coconut (which can not be pasteurised) as well as eggpulp, and obtained good results with ethylene oxide, although the radiation preservation of foodstuff should be borne in mind. Either gamma rays from spent fuel rods from nuclear reactors or cobalt 60, or electron sources from resonant transformers, linear accelerators or Van de Graaf generators may serve this purpose.

Salmonella in Organic Fertilisers and Animal Food

We could find no Australian literature on the occurrence of salmonellae in blood and bone, meat meal, fish fertiliser and bone dust, but there are important references from overseas by Mueller, Rasch, Bischoff, Rohde, Richter, Walker, etc. It is of interest that the only literature available to us on salmonellae in organic fertilisers in Australia originated from Mueller in Copenhagen, who found that in nine imported bone samples from Australia ("knuckle and toe bones" and crushed bones) five samples contained salmonellae. The following serotypes were identified : S. typhi murium, S. bredeney, S. derby, S. san diego, S. waycross and S. adelaide.

We commenced, therefore, the examination of the different organic fertilisers and animal fodder such as "meat meal" which were available in Western Australia.

From the results of the first part of these examinations which are still in progress, it was evident that a high percentage of the samples obtained from different retail shops contained salmonella species. Our material in 1957 consisted of only eight specimens and four of these (corresponding to 50 per cent.) were contaminated.

The method of examination was as follows : From each sample at least two 10 Gm. specimens were examined ; one in 100 ml. single strength selenite enrichment medium and the second in 100 ml. tetrathionate broth in screw-capped specimen jars which were thoroughly shaken to obtain an even distribution. Subcultures were made after 24 and 72 (or 48) hours incubation on to S.S. agar (Difco) and bismuth sulphite agar (Difco) plates.

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* According to Dr. Nancy Atkinson this strain represents a new salmonella serotype.

In the small number of specimens referred to above, two samples of blood and bone were contaminated by S. oranienburg, one sample with S. derby, and one sample of meat-meal contained two salmonella serotypes, (a) S. san diego and (b) S. nyborg.

These preliminary results should draw attention to the possibility of the dissemination of salmonellae through fodder to domestic animals ; chickens, pigs, etc. From our current investigations on salmonella bacteria in *mesenteric glands*—from which these bacteria may be temporarily excreted with the faeces—it can already be said that the results confirm a heavy salmonella infestation in pigs and cattle. The spread of salmonellosis in the chicken stock in England, through waste from imported dried egg powder from U.S.A. being fed to the poultry with other kitchen refuse, is a classical example and the infected fodder in Australia represents a no less danger. It is obvious that under suitable conditions these circumstances can lead to the serious dissemination of food poisoning in man.

The use of salmonella infected organic fertilisers is as potentially dangerous as the foodstuff itself and infected animals or even vegetables may cause an indirect infection in man.

Heat treatment of fertilisers and fodder of this type will destroy the pathogens and it should be essential for all these products to be bacteriologically controlled. The source of contamination may be partly due to the improper hygienic conditions in the factories which produce these meals and fertilisers as many of these products undergo heat treatment which should kill the salmonella bacteria. A re-contamination of the processed product is very probable. A regulation concerning heat treatment : steam at 100° C. or autoclave at 125° C. or dry heat sterilisation at 140° C. of the finished products would be essential.

An interesting observation can be seen from Table No. 10.

Table No. 10

Positive Salmonellae from Blood and Bone

From eight specimens four were positive : 50 per cent.
From specimens Nos. 96, 97 and 99, ten 10 gm. samples were examined.

Medium	Selenite					Tetrathionate					Types
Sample	a	b	c	d	e	a	b	c	d	e	
M 96 (4762)	—	—	—	—	—	+	+	+	—	+	S. san diego S. nyborg
M 97 (4763)	—	—	—	+	+	—	—	—	+	—	S. derby
M 98 (4764)	+	+				+	+				S. oranienburg
M 99 (4757)	—	—	+	+	+	+	—	+	+	+	S. oranienburg

In Selenite enrichment : 7 positives. In Tetrathionate enrichment : 11 positives.

Three of the four positive blood and bone and meat-meal specimens were examined by comparing five 10 gms. samples in each of the selenite and tetrathionate enrichment media. The specimens M. 98 and M. 99 showed differences between the individual samples which can be explained by the distribution of salmonellae in the material. But from M. 96 all five selenite samples gave a negative result in contrast to tetrathionate, in *four* samples of which salmonellae were isolated. Similar findings were noted by W. Smith (J. Hyg., 1952, V. 50, p. 21) during the isolation of salmonellae from the faeces of different animal species.

During our work we noticed that a heavy inoculation from selenite medium to bismuth sulphite plates may inhibit the growth of salmonellae as also of other bacteria, although in our laboratory the Selenite medium generally gave more favourable results, even when combined with bismuth sulphite agar, than the tetrathionate broth. The inhibition mentioned above was previously observed by Cook, Frisby and Jebb (Monthly Bulletin, Ministry of Health, London, 1951, V. 10, p. 89) with Salmonella paratyphi B. This phenomenon is due to the *double inhibitory* effect of selenite and bismuth sulphite and can be reproduced by streaking two drops of sterile Selenite medium over half of the bismuth sulphite agar plate, when after drying, the plate is inoculated with a faecal specimen or, for instance, with a pure culture of S. typhi, no growth or heavy inhibition will take place on the treated half of the plate. No inhibition by tetrathionate was seen. In contrast to the bismuth sulphite agar no inhibition by selenite enrichment medium was seen on S.S. agar.

Medium for Sterility Test

As the laboratories perform sterility tests for the pharmaceutical industry and for autovaccines prepared by us, the effectiveness of the Clausen modification (Acta Path. & Microbiol. Scand., 1956, V. 38, p. 107) of the hydrosulphite medium by Bonnel was tested and is now used for our sterility tests.

The medium contains 1 Gm. per litre $Na_2S_2O_4 : 2H_2O$ instead of thioglychollate. We replaced the Orthana Peptone with Casitone (Difco) which is easier to obtain. The sodium hydrosulphite inactivates Merthiolate (Thiomersal) and phenylmercuricacetate and allows good growth in the presence of 1 : 10,000 phenol.

The advantage of the medium against the fluid thioglychollate medium is its greater stability. It does not change its redox potential for a relatively long time, can be kept at least four weeks and can be sterilised at 120° C.

Bactericidal and Chemotherapeutic activity of Western Australian Plant Extracts

Extracts from the following plants were examined for their bactericidal and chemotherapeutic activity :—

Actinostrobus arenarius (columella) methanol extract.
Actinostrobus arenarius (nut casin) methanol extract.
Actinostrobus arenarius (seed) methanol extract.
Cryptopleurine the alkaloid of Cryptocarya pleurosperma.
Cryptopleurine—toxicity tests on guinea pigs.
Cryptopleurine—chemotherapeutical test on guinea pigs.
Darwinia citriodora " flower " oil.
Darwinia citriodora oil from leaves.
Scaevola spinescens watery extract.

For these tests the following bacteria were used : B. coli, Staphylococcus aureus, Enterococcus, M. phlei.

Toxicity tests were performed with Cryptopleurine and its effect on experimental tuberculosis in guinea pigs was tested.

All the above experiments showed no significant results.

SEROLOGICAL SECTION

Mr. A. F. Drummond, Technical Officer, gives the following account of the work in this section :—

" During 1957, the Serology Laboratory carried out the following tests :—

Table 11

	R.P.H.	Public Health	Total
Serology—			
Wassermann Reactions	1,107	5,161	6,268
Kahn Tests	950	4,572	5,522
Cardiolipin Tests	1,056	4,733	5,789
Meinicke Reaction	6	43	49
Gonococcal Complement Fixation Tests	244	1,129	1,373
Hydatid Complement Fixation Tests	15	15	30
Widal Reactions	564	750	1,314
Weil-Felix Reactions	188	250	438
Abortus Agglutinations	191	255	446
Antiglobulin Test for Brucellosis	12	1	13
Rickettsial Agglutination and C.F.T.	5	3	8
Anti-Streptolysin O Titre Estimation	102	160	262
C. Reactive Protein	48	45	93
Cold Agglutinins	16	2	18
Paul Bunnell Tests	101	82	183
Rose and Ball Tests	144	211	355
Euglobulin	89	....	89
S. typhi Vi	2	12	14
Lecture to Nurses	....	18	18
Miscellaneous	16	24	40
Medico Legal Examinations—			
Chemical Tests for Blood	....	83	83
Serological Tests for Blood	....	132	132
Hair	....	45	45
Semen examination—(a) chemical	....	35	35
(b) micro	....	35	35
Hormone Tests—			
Toad Tests (Qualitative)	425	1,483	1,908
Toad Tests (Quantitative)	18	17	35
Friedman Tests	1	4	5
Aschheim Zondek Test (Qualitative)	5	....	5
Aschheim Zondek Tests (Quantitative)	1	2	3
	5,306	19,302	24,608

Rose and Ball Tests

The technique employed in routine Rose and Ball tests in this laboratory has, for the past three years, been the " Differential Agglutination Titration " method of Rose, *et al* (Proc. Soc. Exp. Biol. NY, 1948, 68 1). We have come to regard results of 32 and higher as indicative of Rheumatoid Arthritis. (Although we do not know at present whether a result obtained by say, a high denominator and a high numerator is of the same significance as the same quotient obtained from lower denominators and numerators.)

We employed further another method—absorption by sheep cells—for comparison, on 103 sera (J. Ball, The Lancet, II, 1950, p. 520).

On 89 of these sera, still a third method was used, by precipitating the euglobulin fraction of absorbed serum with citrate-phosphate buffer (personal communication Dr. Hess, London).

Results of the first and second methods agreed in 80·6 per cent. of cases, the first and third, 79·8 per cent., and the second and third, 71·9 per cent.

The second method proved to be more sensitive than the first and third methods.

The cases for comparison were selected by Dr. P. Goatcher.

Pregnancy Tests

The great majority of these tests were done on Bufo marinus male toads. Where sufficient urine was submitted, each specimen was inoculated without concentration into *two* toads.

The importance of using duplicate tests was again apparent this year, when we found that even with the most careful technique, 45 pairs of toads, or 4·7 per cent. of all specimens, showed discrepant results.

The probable reasons for the discrepancies were set out in the Annual Report of 1956. In 11 of the discrepant cases this year, the urines appeared to have been collected rather too soon, after conception. In many instances, urines were not " first morning specimens ", as requested.

A case stated to be 16½ weeks pregnant, provided interesting results. A toad test on her unconcentrated urine was negative, in another laboratory.

Because her obstetrician was not satisfied, the tests were repeated by us and an acetone concentration done. These were all negative. A Friedman Test on the same specimen was positive and the pregnancy proceeded normally.

Serology of Syphilis

The Meinicke Clearing Reaction was introduced to check, when possible, serologically positive, non-treponematic cases, i.e. cases without clinical indications of treponemal infection.

Since only 49 sera were tested by the M.K.R. II during 1957, it is not proper to report findings at this stage, except to refer to the ease of performance of the test, and the clear results obtained."

PUBLIC HEALTH LABORATORIES, BUNBURY BRANCH

Dr. L. Szaloky, in charge of this laboratory reports : " The Bunbury Branch of the Public Health Laboratories was opened on 1st October, 1957, and a laboratory attendant was appointed to assist with the work. There was an immediate demand for laboratory tests and these are now being met satisfactorily. Members of the medical profession in Bunbury, as well as the hospital staff, encouraged us in our work.

A weekly visit was made to Busselton to collect specimens and to carry out tests in the local hospital. Besides the examinations performed for the Bunbury/Busselton District, requests and specimens were received from Collie, Margaret River, Donnybrook and Bridgetown." Statistics are given in Table 12 at the end of this report.

Acknowledgments

Mr. A. F. Drummond, the Technical Officer of the Laboratories, most ably assisted in the administration and in solving technical problems. His wide experience facilitated the smooth running of the laboratories. In addition to the routine serological work, Mr. Drummond carried out most of the medico-legal examinations.

In conclusion I would like to thank the staff for their co-operation and interest in the work.

NICHOLAS KOVACS, M.D.(Vienna), M.R.C.P.A.,
Bacteriologist.

Table No. 12

Public Health Laboratories, Bunbury Branch

Distribution of Specimens

	Public Health	Bunbury District Hospital	Total
Bacteriology—			
Blood Cultures	4	1	5
C.S.F.—(a) Culture	3	4	7
(b) Micro	3	6	9
Dark Ground Examination	....	1	1
Ear and Eye Swabs	3	....	3
Gonococci smears	6	....	6
Throat swabs—(a) cultures	1	1	2
(b) micro	1	1	2
Nasal swabs	1	....	1
Pus cultures	8	2	10
Sputa—(a) cultures	4	2	6
(b) micro	5	3	8
Urine—(a) cultures	13	3	16
(b) micro	27	6	33
Faeces—(a) cultures	5	1	6
(b) micro	6	2	8
Vaginal swabs—(b) micro	1	....	1
Sensitivity Tests	26	10	36
M. tuberculosis	2	3	5
Faeces, worms and ova	5	2	7
Vaginal smears for Trichomonas	....	1	1
Spermatozoa examination	1	....	1
Mantoux Tuberculin Skin Test	2	7	9
Total	127	56	183
Haematology—			
Hb estimation by Photoclectrocolorimeter	160	23	183
Erythrocytes count	113	18	131
Leucocytes count	113	21	134
Reticulocytes count	2	....	2
Differential Leucocytes count	104	18	122
Blood films	116	12	128
Haematocrits	5	2	7
Absolute Values	5	1	6
Prothrombin time estimation	11	9	20
E. S. R.	11	12	23
Grouping—(a) A.B.O.	54	2	56
(b) Rh	54	2	56
Direct Coombs Test	1	....	1
Indirect Coombs test for Rh antibodies	11	1	12
Rh antibodies titration	10	....	10
Compatibility test	12	6	18
Bleeding time (Duke's method)	1	2	3
Clotting time (Lee & White's method)	1	3	4
Clot retraction	....	2	2
L. E. cells	1	....	1
Total	785	134	919
Biochemistry—			
Total Protein	6	3	9
Albumin	6	3	9
Globulin and A/G Ratio	6	3	9
Glucose	5	3	8
Chlorides	3	....	3
Urea	18	5	23
Alkaline Phosphatase	2	1	3
Thymol Turbidity test	1	....	1
Bilirubin	5	2	7
Van der Berg reaction	5	2	7
C.S.F.—(a) protein	4	3	7
(b) chlorides	4	2	6
(c) glucose	2	1	3
Urine—(a) albumin	9	....	9
Faeces : Occult blood	....	2	2
Glucose Tolerance test	2	....	2
Insulin Glucose Tolerance test	1	....	1
Fractional Test Meal	3	....	3
Urea Clearance test	1	....	1
Total	83	30	113
Total of all Laboratory Examinations	995	220	1,215

Appendix III

REPORT FROM THE DIRECTOR, TUBERCULOSIS CONTROL BRANCH TO THE COMMISSIONER OF PUBLIC HEALTH

I have the honour to report on activities for the year ended 31st December, 1957.

For ease of comparison the report is submitted in a form standard with previous years :—

(1) Records and Statistics.
(2) Prevention.
(3) Case Finding.
(4) Medical Care and Isolation.
(5) Social and Economic Protection of Sufferers.
(6) After-Care and Rehabilitation.
(7) Developments.
(8) Conclusion.

(1) RECORDS AND STATISTICS.

STATISTICAL TABLE.

Year.	Mean Population 1,000s.	Notifications.			Number on Register.			Prevalence per 100,000.		Number Receiving T.B. Allowance.	Deaths.			Death Rate per 100,000.	
		Pulm.	Non-Pulm.	Total.	Pulm.	Non. Pulm.	Total.	Pulm.	All Forms.		Pulm.	Non-Pulm.	Total.	Pulm.	All Forms.
1950	558	586	18	604	2,100	....	....	376	....	515	125	3	128	22·4	22·9
1951	580	467	37	504	2,402	75	2,477	413	426	474	76	6	82	13·1	14·1
1952	601	508	49	557	2,574	94	2,668	428	444	396	75	7	82	12·5	13·6
1953	621	378	34	412	2,762	120	2,882	445	464	361	43	3	46	6·9	7·4
1954	640	348	34	382	2,769	97	2,866	432	447	326	57	4	61	8·9	9·5
1955	659	413	39	452	2,965	128	3,093	450	469	330	31	2	33	4·7	5·0
1956	677	424	44	468	2,900	146	3,046	428	457	264	43	3	46	6·3	6·8
1957	692	332	32	364	2,786	156	2,942	403	425	198	36	1	37	5·2	5·3

The annual mortality rate for tuberculosis of all forms has fallen to 5·3 per 100,000 of the population, and for pulmonary tuberculosis to 5·2. Analysis of the 36 deaths from pulmonary tuberculosis shows only five occurring under the age of 50 years ; eight in the 50–59 age group ; 12 in the 60–69 group, and six over the age of 70, and five over 80 years of age.

The number of notifications of pulmonary tuberculosis during the year—332, has fallen markedly, although case finding activities have continued at the same level.

Of those notified, 241 were males, disease classified " Minimal " in 66, " Moderately advanced " in 115, " Advanced " in 54, and six pleural effusions ; and 91 were females, 36 " minimal," 48 " moderate " and seven " advanced " disease.

Once again, the peak distributions of male cases were at the ages of 45 and 55, but there was a more even spread between the ages 25 to 70 years.

The majority of female patients were of the 30 to 40 age group.

There were only six notifications of patients under 20 years of age : a boy of two, two girls of three and four, and three girls aged 16, 19 and 19 years.

There were no notifications at all in the 5 to 15 years age group.

The Tuberculosis Case Register shows an acceleration of the downward trend in the number of pulmonary cases, the prevalence of the disease being now recorded at 403 per 100,000 of the population, the lowest for six years.

Of 492 removed from the Register during the year, 287 were considered controlled or " cured " ; 74 transferred out of the State ; a revised diagnosis was made in 32 instances ; 13 were untraceable, and there were 37 deaths due to tuberculosis and 49 due to other causes.

At the end of the year, 198 persons were receiving the Tuberculosis Allowance, 161 males and 37 females, a further marked drop and a very satisfactory figure compared to the peak of 515 in 1950.

Of the 2,786 pulmonary cases, 448 are noted as arrivals from abroad since 1948, 160 British and 288 Alien.

During the year, 144,801, 35 and 70 mm. micro films were taken, of whom 90,321 were taken in the Metropolitan area and 54,480 in the country.

The total number of micro films taken by the Tuberculosis Control Branch since 1948 is now 732,022. This excludes routine micro films in hospitals.

A total of 12,183, 17 x 14 films were taken at the Perth Chest Clinic, bringing the total since 1948 to 107,410.

(2) PREVENTION.

The Matron Chest Clinic reports 4,331 visits by Clinic sisters to 2,035 patients (including Repatriation patients). There were only eight patients with positive sputum, in the Metropolitan area.

One thousand five hundred and thirty-one patients attend Perth and Fremantle Clinics, 290 of whom are receiving chemotherapy as out-patients.

One hundred and seventy-three patients attend Kalgoorlie Clinic, of whom 35 are receiving chemotherapy.

Attention was paid to improvement of living conditions of patients, when necessary, and liaison with the State Housing Commission resulted in the provision of 14 houses and transfers in six other instances. A full report of the Almoner who effects liaison between Sanatorium and Clinic staff in regard to patients' requirements is shown in the following report of the Superintendent of Wooroloo, Dr. H. R. Elphick.

B.C.G. Vaccination.

The use of this vaccine was again restricted to National Service Trainees, school leavers, hospital staff and contacts of known cases.

Five thousand and thirty-nine Mantoux tests were carried out and 2,311 vaccinations using the freeze-dried vaccine were performed, of whom 137 were babies under the age of two years, in the " contact " group. One hundred per cent. conversion was obtained in this latter group, but some disappointment was felt at the poor conversion rate in the older children and adolescent age group, as of the 1,625 who had follow up Mantoux tests that were examined, only 1,337 gave positive reactions. In previous years, using liquid vaccine, a 100 per cent. Mantoux conversion rate was invariably obtained.

" Morriston " Preventorium.

The number of babes and infants from tuberculous households admitted was identical with the previous year, namely 36, and the daily average bed state was 10. The majority of admissions were new born babies from mothers undergoing treatment or where isolation was still considered necessary.

Action under Sections 293 *and* 294 *of the Health Act.*

Twenty-two persons were " required to undergo chest X-ray for tuberculosis," including nine who did not report for investigation after mass survey and 13 others on the Case Register. The value of this follow up was shown as, subsequent to this action, two persons entered Wooroloo for treatment, out-patient treatment was commenced in two others, and others resumed clinic supervision.

Two persons suffering from tuberculosis in an infectious state " not conducting themselves to preclude infection to other persons," were directed to enter Wooroloo Sanatorium, and subsequently did so.

(3) CASE FINDING.

(i) *Mass Radiography.*

Extensive compulsory mass chest X-ray surveys were continued, the first survey of the Metropolitan area being completed at the end of the survey of the Municipality of South Perth on 1st March.

This first survey of the Metropolitan area which commenced in August 1954, examined 197,592 persons over the age of 16 years, and resulted in the discovery of 285 individuals suffering from pulmonary tuberculosis, a further 275 suspects (as at 1st March, 1957) ; 65 with cancer of the lung, and 2,892 with abnormalities of some kind or other.

The second survey of the Metropolitan area was commenced at Midland Junction with a visit to the W.A.G.R. Workshops on 29th July, and subsequent surveys of Midland Junction, Guildford, Bassendean, Bayswater, and the Maylands, Inglewood, Mt. Lawley and Osborne Park sections of the Perth Road Board.

A wide coverage of country districts was made including the 58 Road Board Districts of Armadale-Kelmscott, Darling Range, Mundaring, Cockburn, Beverley, Brookton, Pingelly, Cuballing, Kwinana, Rockingham, Broomehill, Tambellup, Cranbrook, Plantagenet, Gnowangerup, Murray, Mandurah, Bruce Rock, Narembeen, Corrigin, Quairading, Wanneroo, Chittering, Gingin, Victoria Plains, Goomalling, Wongan-Ballidu, Dalwallinu, Perenjori, Morawa, Irwin, Mingenew, Three Springs, Carnamah, Dowerin, Wyalkatchem, Kununoppin-Trayning, Mukinbudin, Mt. Marshall, Koorda, Kondinin, Kulin, Wickepin, Dumbleyung, Lake Grace, Nyabing-Pingrup, Serpentine-Jarrahdale, Marradong, Wandering, West Arthur, Dardanup, Capel, Balingup, Greenbushes, Preston, Upper Blackwood, Nannup, Augusta-Margaret River, at 112 Centres.*

Once again in this State, no material difference was found in the incidence of significant pulmonary tuberculosis in Metropolitan and country areas ; the identical finding now being ·08 per cent. or less than one per 1,000.

(ii) *Patients Referred by Medical Practitioners.*

(a) *Metropolitan Area.*

There was a slight increase in the number of patients referred as suspects and for routine examination, to 3,737 ; but once again it appears that the Metropolitan surveys have had an influence in the referral of possible suspect cases. The incidence of pulmonary T.B. in this group is the lowest ever recorded at 0·4 per cent.

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* *Centres.*—Armadale, Augusta, Balingup, Ballidu, Banksiadale, Bencubbin, Beverley, Bickley, Bindoon, Boddington, Bolgart, Borden, Boya, Boyanup, Boyup Brook, Brookton, Broomehill, Bruce Rock, Burekup, Calingiri, Capel, Carnamah, Chidlow, Coorow, Corrigin, Cowaramup, Cranbrook, Cuballing, Dalwallinu, Dardanup, Darkan, Darlington, Dongara, Donnelly Mill, Donnybrook, Dowerin, Dumbleyung, Duranillin, Dwellingup, Forrestfield, Glen Forrest, Gnowangerup, Goomalling, Greenbushes, Greenmount, Hamilton Hill, Hyden, Jandakot, Jarrahdale, Kalamunda, Karridale, Kelmscott, Kirup, Kondinin, Koorda, Kukerin, Kulin, Kununoppin, Kwinana Refinery, Lake Grace, Lake King, Latham, Lesmurdie, Mahogany Creek, Maida Vale, Mandurah, Margaret River, Medina, Mingenew, Morawa, Mt. Barker, Mt. Helena, Muchea, Mukinbudin, Mundaring, Mundijong, Nannup, Narembeen, Newdegate, New Norcia, Nyabing, Ongerup, Parkerville, Perenjori, Pickering Brook, Pingelly, Pingrup, Pinjarra, Quairading, Rockingham, Rocky Gully, Safety Bay, Sawyers Valley, Serpentine, Shackleton, South Coogee, Stoneville, Swan View, Tambellup, Three Springs, Trayning, Wandering, Wanneroo, Wattle Grove, Wickepin, Wongan Hills, Woodmans Point, Wooroloo, Wundowie, Wyalkatchem, Yanchep, Yericoin.

(b) *Country Areas.* from the same 58

A further increase again in this work was noted, as 8,934 films were reported on country centres enumerated in the 1955 report.

This continues to be a very important group for case finding, as 17 tuberculosis patients were notified, or 1·9 per thousand, apart from 84 suspects and 1,072 other abnormalities.

The Tuberculosis Officers at the main country centres, Dr. A. E. Vivian, Albany ; Dr. W. Lawson Smith, Bunbury ; Dr. J. R. Hankey, Collie ; Dr. A. J. Beaumont, Geraldton ; Dr. A. McL. Robinson, Northam ; and Dr. W. J. Grey, Merredin, continued to assist the Department at these Centres. Tribute must be paid here to the fine work of Dr. Allan B. Webster, who represented this Branch and conducted the Chest Clinic at Kalgoorlie for many years before his retirement from active practice early in the year.

(iii) *Hospital In-Patient and Out-Patient Group.*

Due to increasing pressure of work at the X-Ray Departments of the major Metropolitan Hospitals, the numbers examined by routine chest X-ray have fallen away, although many are examined by large films.

Only 1,287 in- and out-patients at the Royal Perth Hospital are registered as having attended for 35 mm. film routine chest X-ray examination. Records of 17 x 14 films are not available.

At Fremantle Hospital, 2,710 large films and 423 35 mm. micro films were taken. Four cases of pulmonary tuberculosis were discovered as a result.

The value of routine X-rays, however, was again still shown by the efficient work at the St. John of God Hospital, Subiaco, where three sufferers from active pulmonary tuberculosis were discovered amongst 3,441 in-patients X-rayed.

At the King Edward Memorial Hospital there were 1,783 micro films taken of ante-natal patients. Although no active tuberculosis was discovered, several other abnormalities of consequence were discovered, including one hydatid cyst.

(iv) *Migrants.*

The Commonwealth Health and Immigration Departments again assisted in the activities necessary to evaluate any incidence of pulmonary tuberculosis amongst migrants.

There were 13,405 arrivals during the year comprising 8,560 British full fare paying passengers (including returning Australians), 1,960 assisted British migrants and 2,885 Aliens.

A total of 2,109 large films of assisted migrants were submitted for recheck and 1,302 reported for examination as a result of receival of pamphlets on arrival.

During the year, there were 69 migrants notified of arrivals since 1948, comprising British full fare paying 12, British assisted 9, Seamen 5, Aliens 43.

These 69 notifications resulted from, voluntary chest X-ray 14 ; compulsory chest X-ray survey 19 ; referred by Medical Practitioners 11 ; re-examination of films produced on arrival 4 ; reporting as result of pamphlet 1 ; applicants to mining industry 3 ; under observation for over one year 6.

There were 16 notifications of arrivals during the year : 3 British assisted ; 3 British full fare ; 4 Yugoslav ; 1 British Chinese ; 4 seamen ; 1 Malayan (non-pulmonary). Eight of these were admitted to hospital.

Analysis of the above figures, and of the Case Register which shows 448 Migrant arrivals since 1948 (160 British and 288 Alien) suggests that although there is no undue prevalence of tuberculosis in Migrants, continued careful supervision of all new arrivals is necessary in spite of the care taken at ports of origin, and that further efforts must be made to obtain a more complete coverage on arrival at Fremantle.

(4) MEDICAL CARE AND ISOLATION.

Excellent results continue to be obtained from treatment with Streptomycin, P.A.S. and Isoniazid. In fact, it is rare that an infectious case does not become non-infectious after the initial two to three months treatment.

For the patient with definitely established pulmonary disease, the average length of stay in hospital remains at nine to ten months.

In Dr. Elphick's report is also the first encouraging statement for some years that there is a lessening of the figure for relapse and re-admission.

We feel that this is the result of treatment continued long term under out-patient Clinic supervision. The same long term treatment gives " sterilization " of the disease process in the lungs, and this has now definitely resulted in a lessening of the need for the added aid of surgical procedures. Removal of residual disease process according to extent, remains the operation of choice, usually segmental resection, less commonly lobectomy and total removal of the lung, pneumonectomy.

Repatriation General Hospital, Hollywood.

Eighteen female patients were admitted for surgery and treatment to the special beds available for civilian patients.

Royal Perth Hospital.

There were 155 patients admitted for treatment for pulmonary tuberculosis, including 78 for surgical procedures from Wooroloo Sanatorium.

There were 121 transfers to Wooroloo ; 2 to Repatriation General Hospital, Hollywood ; 1 to Fremantle ; 25 discharged home, and 3 deaths.

Fremantle Hospital.

There were 18 admissions of patients suffering from pulmonary tuberculosis—including two transfers from Wooroloo and one from Royal Perth Hospital. There were five transfers to Wooroloo ; two to Repatriation General Hospital ; one to Royal Perth Hospital ; and nine discharged home.

Princess Margaret Hospital for Children.

There were 18 admissions during the year : six of primary pulmonary tuberculosis with radiological lesions (three being Migrants) ; five T.B. glands of the neck (one Migrant) ; one case of T.B. Meningitis (Migrant) ; and one T.B. Kidneys (Migrant).

Five children were admitted following Mantoux conversion for observation and initiation of prophylactic chemotherapy.

Two of the six cases showing radiological pulmonary lesions were from the same half-caste aboriginal group that produced the five patients mentioned in the 1956 report.

There were no deaths during the year.

Claremont Mental Hospital.

At the end of the year there were only 47 patients, 32 male and 15 female, in the Tuberculosis Block, and in which the disease was considered active in 10 cases.

Out-Patients Clinics.

Perth Chest Clinic.

Clinics by appointment are held on four mornings—one surgical. Attendances remained steady with the previous year.

The Artificial Pneumothorax Clinic ceased, the last patient attending on 19th July, thus marking the end of an era of tuberculosis treatment in this State.

Fremantle Chest Clinic.

The Out-patient Clinic was held one afternoon per week, and attendances were exactly comparable to 1956, namely, an average of 11 per clinic. The number of patients diagnosed during the year from all activities of this Clinic with active pulmonary tuberculosis however, dropped to 16.

Kalgoorlie Chest Clinic.

In view of the importance attached to incidence of tuberculosis in the Goldfields (*see* previous Annual Reports) a full time Medical Officer was appointed early in the year to the Chest Clinic attached to the Kalgoorlie District Hospital, (*see* also under Section 7). His report is therefore included in full :

" The work of the Kalgoorlie Chest Clinic is integrated of necessity with the medical and radiological supervision of Mine workers throughout Western Australia.

Of 37 active cases of pulmonary tuberculosis detected in 1957, 22 cases occurred in miners or ex-miners and could be attributed directly to the mining industry. (Does not include miners or ex-miners diagnosed elsewhere.)

Complicated silicosis is still a major problem. Tuberculosis is the most important complication but chronic bronchitis and mass pulmonary fibrosis perhaps cause more disability. Every chest infection in a worker exposed to dust risk should be carefully treated and return to work delayed until full resolution has been achieved clinically and radiologically. If the pulmonary fibrosis caused by non-specific infections were prevented, the tuberculosis problem would be manifest and more easily remediable.

In 1958, every miner with an abnormal chest X-ray will have clinical and bacteriological investigation with regular reviews. Where warranted, admission to hospital will be urged for more complete investigation. Negative bacteriological tests are not conclusive proof that a man with silicosis is non-tuberculous. A bacillus which fails to grow in an incubator may thrive in the confined, humid, dark or artificially lit underground.

The problem is to separate and isolate the chronic low grade active silico-T.B. which form the " infector pool " from the silicotic with non-specific fibrosis."

No. of T.B. cases on Register	145	
No. of new cases notified (included cases not on our Register)	33	
No. of cases removed from Register		16
No. of cases Deceased		11
No. of cases Transferred		7
		34

No. of miners requiring special supervision	190
No. of ex-miners requiring special supervision	uncounted as yet
No. of cases admitted to the Kalgoorlie District Hospital for investigation (of whom 12 were transferred to Sanatorium)	18
Total number of admissions to Wooroloo Sanatorium and Repatriation General Hospital, Hollywood (includes one to Princess Margaret Hospital)	37
No. of re-admissions to Repatriation General Hospital and Wooroloo Sanatorium	6
No. of Chest X-rays (Miners)	5,566
No. of Chest X-rays	4,152
No. of Clinic X-rays	2,421

Laboratory.

The Laboratory has settled down to steady work in its new quarters, with the result that much more investigation work is being carried out. The following investigations were carried out from Perth and Fremantle Chest Clinics, including work from country hospitals—excluding work of Metropolitan hospitals :

		No. of Tests.	Individuals.
1.	Sputum Examinations	2,943	775
	Positive Results for M. tuberculosis	181	65
2.	Gastric Contents	881	225
	Positive Results for M. tuberculosis	139	35
3.	Laryngeal Swabs	448	74
	Positive Results for M. tuberculosis	22	6
4.	Pleural Fluids	12	4
	Positive Results for M. tuberculosis	....	....
5.	Cerebral Spinal Fluid	12	4
	Positive Results for M. tuberculosis	....	....
6.	Urine	214	37
	Positive Results for M. tuberculosis	13	2
7.	Other specimens—Pus, Sections, etc.	79	35
	Positive Results for M. tuberculosis	19	5

A fuller report of the work of the T.B. Laboratory will be found in the report of the Public Health Laboratories.

Dental Clinic (Perth Chest Clinic).

Although not covering the amount of work envisaged when this unit was planned—due to the decreasing number of potentially infectious patients—there were 269 visits from 47 patients during the year, and 194 procedures completed.

(5) SOCIAL AND ECONOMIC PROTECTION.

The Tuberculosis Allowance rate was increased as at 24th October, 1957, to £10 7s. 6d. per week for the married sufferer with dependent wife, plus 10s. for each dependent child ; and to £4 7s. 6d. per week for the single sufferer in hospital ; and to £6 10s. when undergoing domiciliary treatment. Permissible other income remains at £7 per week for married male patients (between husband and wife) and £3 10s. per week for single persons.

It is pleasing to record a further marked drop in the number of persons receiving the Allowance in this State. As at 31st December, 1957, there were 198 persons receiving the Allowance, comprising 161 males (102 in hospital) and 37 females (25 in hospital). One hundred and seventy-nine were Australian-born and 19 were migrants, comprising eight Displaced Persons, four English and seven European.

(6) AFTER-CARE AND REHABILITATION.

The result of early diagnosis and improved medical care has resulted in a lessening of the need for rehabilitation of tuberculosis patients. Return to former employment is more often the rule with less need for special training for new employment.

The rehabilitation procedures commenced in the Sanatorium by the Education and Training Officer of the Social Services Department, are further supervised on discharge by the Tuberculosis Physician and the Senior Medical Officer of the Department of Social Services, Dr. Tomlinson ; and detailed figures are shown in Dr. Elphick's following report. This shows 38 ex-patients placed in employment during the year, 16 commenced training, and the same number in training at the end of the year.

There has been a decrease in the number in training at the end of the last three years from 45 to 36 to 16.

The Physically Handicapped Section of the Commonwealth Employment Service was again of assistance and 32 patients were helped to obtain jobs during the 12-month period.

The Tuberculosis Association of Western Australia continues to do fine work in the Federal Box Factory now installed in its own premises in West Perth, and Dr. Edwards now acts as Medical Adviser to these patients. There were 10 ex-patients employed at the beginning of the year ; 25 engaged during the year, and 10 in employment at the end of the year.

(7) DEVELOPMENTS.

The long term plans for the appointment of a full-time Chest Physician, and the establishment of a full-time Chest Clinic at Kalgoorlie, came to fruition in March of the year with the arrival of Dr. J. McNulty from England. This appointment was made because of the awareness of the difficulty of eradication of pulmonary tuberculosis from the Goldfields in view of the number of underground miners exposed to silica dust. (See previous Annual Reports, particularly 1954.)

Dr. McNulty also carries out the regular reviews of miners ; and the indications are as shown in his report, that in spite of past efforts by this Branch, considerable research and work are still required into the problems of silicosis and silico-tuberculosis amongst gold miners.

Over the past three years (not reported before) routine prophylactic administration of Isoniazid has been carried out (under the supervision of Dr. Edwards) on 28 children under eight years of age known to have been " Mantoux converters." This prophylactic treatment has been given in the absence of a clinically demonstrable primary lesion but when there has been some suspicion of associated ill-health.

The Perth Chest Hospital is nearing completion and should be ready to receive patients in the middle of 1958. It has been a pleasure to be associated with the officers of the Public Works Department in this project.

(8) CONCLUSION.

There is a lessening in the amount of infectious pulmonary tuberculosis in the community.

Compulsory mass chest X-ray surveys are still necessary as a case-finding procedure for the detection of infectious pulmonary tuberculosis, and are also valuable for the detection of Cancer of the lung, Industrial Thoracic disease, Acute and Chronic Non-Tuberculous disease, Chest Tumours and Cardiovascular abnormalities.

The results of " long term " drug treatment are now excellent and there is lessening in the amount of surgical procedures necessary, and in relapse of disease.

The mortality rate is now relatively insignificant, with the majority of the deaths occurring over the age of 60 years.

For the first time there is a concomitant lowering of the prevalence or morbidity rate, in spite of maximum case-finding effort.

However, in view of the infectious nature of pulmonary tuberculosis, continued vigilance will be necessary, not only on the part of this Branch, but by all medical practitioners throughout the State ; who still play an important part in tuberculosis control.

We must consider re-evaluation of control measures, the importance of the Mantoux test in the younger age groups with the necessity of the extension of prophylactic treatment of recent converters, *i.e.*, those children who have undergone infection with the tubercle bacillus.

A tightening up in X-ray examination of new arrivals may be necessary in spite of difficulties of administration in this regard.

The progress made to date in this, the tenth year of the Commonwealth-State Agreement, suggests the renewal of this arrangement with continuation of existing procedures for a further decade, could well advance this State to the position where the incidence of pulmonary tuberculosis would be at a minimum.

In conclusion, I would like to express my thanks for the co-operation of the Repatriation Commission, and the help of Dr. W. Harris, Chest Specialist to this authority ; and to all members of the staff of the Branch, particularly to Drs. Elphick, Heymanson and Edwards.

Your help and that of the Under Secretary, Mr. Devereux, and his Assistant Under Secretaries, Mr. H. Smith and Mr. J. Gibson, has been, as usual, invaluable.

ALAN KING, B.Sc., M.B., B.S., F.C.C.P.,
Director, Tuberculosis Control Branch.

Appendix IV

REPORT OF THE ACTING TUBERCULOSIS PHYSICIAN

The Director,
Tuberculosis Control Branch.

Sir, I have the honour to submit a report for the year ended 31st December, 1957.

PERTH CHEST CLINIC.

Out-patient Clinics.

These are held on Monday, Wednesday and Friday mornings each week.

Total attendance	3,617
Average attendance per Clinic—	
Medical	24
Surgical	5
Chest X-rays taken on large film (Clinic and referred patients)	12,183

Mass Radiography.

Static Unit (at Perth Chest Clinic).

Number of micro film exposures		28,505
Groups X-rayed included the following :		
Volunteers	12,536	
Compulsory Mass Survey Attendance	6,230	
Private patients	1,312	
Contacts	972	
Armed Services	1,692	
Immigrants	965	
Entrants to Commonwealth Public Service	988	
Entrants to State Public Service	460	
Miscellaneous (including National Service Trainees)	3,350	

The total number of retakes on full size film was 556, representing two per cent. of the micro films taken by the Static Unit.

Mobile Units, Metropolitan and Country.

Number of micro film exposures				110,904
Groups X-rayed include the following :				
Metropolitan Mass Survey			50,094	
South Perth	11,999			
Midland Junction (including W.A.G.R. Workshops)	7,928	Surveyed for the second time		
Guildford	1,494			
Bassendean	3,693			
Bayswater	6,706			
Perth Road Board (partially)	18,274			
Country Mass Survey, totalling 58 Road Board Districts			57,573	
Armed Services and National Service Trainees			1,505	
Teachers' Training College			243	
University of W.A.			1,489	

Mass Radiography Findings.

Total persons X-rayed		139,409
Cases of pulmonary tuberculosis notified		107
Admitted to hospital	84	
Under out-patient observation at end of year	23	
Incidence of pulmonary tuberculosis (notified cases only)	0·08%	
Suspect cases of pulmonary tuberculosis under out-patient observation		58
Cases of pulmonary carcinoma		26
Other abnormalities diagnosed		652

Private Practitioners' Patients referred for X-ray.

Number of patients referred (1,312 micro films and 2,425 full size films were taken)		3,737
Cases of pulmonary tuberculosis notified		16
Admitted to hospital	14	
Under out-patient observation at end of year	2	

Incidence of pulmonary tuberculosis (notified cases only)	0·43%	
Suspect cases of pulmonary tuberculosis under out-patient observation		4
Cases of pulmonary carcinoma		12
Other abnormalities diagnosed		675

Mantoux Tests and B.C.G. Inoculations (Perth Metropolitan Area).

National Service Trainees.

Mantoux tests performed			1,569
Positive reactions	789		
Negative reactions	827		
B.C.G. Inoculations		784	

Schools.

Mantoux tests performed			1,371
Positive reactions	306		
Negative reactions	1,061		
B.C.G. Inoculations		984	

Contacts.

Mantoux tests performed			1,465
Positive reactions	483		
Negative reactions	978		
B.C.G. Inoculations		348	

Miscellaneous (Hospital Staffs, etc.).

Mantoux tests performed			451
Positive reactions	240		
Negative reactions	194		
B.C.G. Inoculations		182	
Total Mantoux Tests			4,856
Total B.C.G. Inoculations		2,298	

Prophylactic Treatment in Child Convertors.

Over the last three years routine prophylactic administration of Isoniazid has been carried out on child convertors under eight years old who show evidence of recent conversion. The following figures do not include children who, having a clinically significant pulmonary or other lesion, were admitted to hospital :

1955	Contacts	6
	Non Contacts	*Nil*
1956	Contacts	10
	Non Contacts	*Nil*
1957	Contacts	10
	Non Contacts	2
	Total	28

FREMANTLE CHEST CLINIC.

Out-patients.

Total attendances	519
Average attendance per Clinic	11
Chest x-ray taken on full-size film	2,210

Mantoux Testing and B.C.G. Inoculation.

Mantoux tests performed (including routine tests on admissions to Fremantle Hospital children's ward)		801
Positive reactions	545	
Negative reactions	256	
B.C.G. inoculations given		51

Cases Referred by Private Practitioners.

Patients referred		486
Cases of pulmonary tuberculosis notified		3
Admitted to hospital	2	
Incidence of tuberculosis (notified cases)	0·6%	
Non-tuberculous abnormalities diagnosed		153

Mass Radiography.

Total 35 mm. exposures		5,392
Groups x-rayed were :		
Volunteers	3,805	
Armed Services	682	
Merchant Navy	157	
Commonwealth and State Public Service Candidates	90	
King Edward Memorial Hospital patients	80	
Contacts	158	
Migrants	206	
Miscellaneous	214	

Mass Radiography Findings.

Cases of pulmonary tuberculosis notified (all have been admitted to hospital)		13
Incidence of tuberculosis (notified cases)	0·24%	
Suspect cases under out-patient observation		1
Non-tuberculous abnormalities diagnosed		68

F. G. B. EDWARDS, B.A., LL.B., M.B., B.S.,
Acting Tuberculosis Physician,
Tuberculosis Control Branch.

Appendix V

ANNUAL REPORT – WOOROLOO SANATORIUM

For the Year ended 31st December, 1957

The Director,
Tuberculosis Control Branch,
Chest Clinic,
17 Murray Street,
Perth.

I have the honour to present a report on the activities of the State Sanatorium, Wooroloo, for the year ended 31st December, 1957.

TREATMENT.

Chemotherapy.

As in previous years Streptomycin and Isoniazid were used as the drugs of choice in the initial stages of treatment. Three hundred milligrams of Isoniazid were combined with half a gram of Streptomycin daily in the average case, more severe cases receiving 1 gram of Streptomycin, and this regime achieved almost complete success in the conversion of sputum and apparent control of lesions. In the last quarter of the year, however, the dose of Streptomycin was increased to one gram in all cases, combined with 300 to 400 milligrams of Isoniazid. Para-amino salicylic acid was substituted for Isoniazid after six months' treatment as a rule, and finally, prior to discharge, Isoniazid and P.A.S. were commenced in combination and their continuation advised for one to two years after discharge. The conversion rate of sputum, coupled with the general and radiological improvement in the condition of patients receiving these regimes, indicated their efficacy. Of 150 sputum-positive patients not previously treated with prolonged chemotherapy, 130 (86·6%) converted within three months, 17 (11·3%) within six months and one after seven months. Two others only had failed to convert after six months, and these were subjected to pneumonectomy. Moreover the number of re-admissions in comparison with previous years suggests the attainment of more permanent control of the disease as a result of prolonged outpatient chemotherapy. The following are comparative figures for re-admissions over the last five years.

1957	28
1956	48
1955	60
1954	80
1953	88

SURGERY.

Surgical treatment was performed at Royal Perth Hospital and Repatriation General Hospital by Mr. Clark, Mr. Simpson and Mr. Gibson, and to these surgeons, together with their anaesthetists, Dr. G. R. Troup and Dr. D. C. Wilson, our particular thanks are due.

In the surgical treatment of tuberculous patients, segmental resection again held pride of place, and the final results were universally satisfactory. A summary of surgical procedures carried out on Sanatorium patients is as follows :—

Segmental resections	39
Lobectomies	7
Pneumonectomies	3
Apicolyses with lucite plombage	3
Revision plombage	2
Removal of infected plombs	2
Decortications	4
Curettage of suppurative mediastinal glands	1
Repair of tracheal stricture, associated with pneumonectomy	1

Minor surgical procedures carried out at the Sanatorium :—

Bronchoscopies	60
Pleural aspirations	67
Miscellaneous	100

CONSULTANT SERVICES.

Mr. H. M. Hill, consultant orthopaedic surgeon, Dr. Adrian Lamb, consultant ophthalmologist, Dr. T. Anthony, consultant dermatologist and Dr. W. B. C. Gray, consultant psychiatrist, have visited the Sanatorium at intervals on request, to assist with problems related to their particular fields, and we are grateful to them for their advice and help. During the year five patients were transferred to Royal Perth Hospital for surgical procedures associated with skeletal tuberculosis, as listed below :—

Internal fixation of spine	2
Arthrodesis of hip	1
Arthrodesis of knee and ankle	1
Synovial biopsy (knee)	1

DENTAL SERVICES.

Through the courtesy of Perth Dental Hospital, Mr. Kevin Wren has devoted two full days per week to the care of patients' teeth, and has maintained a satisfactory state of dental hygiene in the majority of patients.

STAFF.

Dr. D. D. Letham was transferred to the staff of the Chest Clinic in November, after almost 10 years continuous and faithful service, carrying with him the good wishes of all staff and patients for his future welfare.

Dr. R. M. Porter has been on sick leave since May, and it is pleasing to report that he has now been discharged from the ward and is making satisfactory progress. His many friends among the staff and patients wish him a speedy recovery and early return to full working capacity.

Dr. P. Z. Fisher returned to the staff in September after 10 months overseas study in Europe, during which time he obtained diplomas in chest diseases and tuberculous diseases at the University of Cardiff.

Dr. J. T. Smyth joined the staff in November and has already given promise of efficient service.

NURSING STAFF.

Once again it is a pleasure to record appreciation of the efficient and conscientious service of the nursing staff. To Matron E. S. Lochhead and her assistant, Matron E. Baker, we are grateful for their loyal support and co-operation at all times.

In recognition of her service to the nursing profession in this State, and particularly at Wooroloo Sanatorium, the Matron received the Order of the British Empire in the New Year's Honours List, and for this honour we offer her our sincere congratulations.

ADMINISTRATION.

The Secretary, Mr. J. L. Cross, is deserving of our appreciation for his co-operation and ready desire to help throughout the year. Under his supervision the clerical staff have performed their duties conscientiously.

Mr. J. Grady, Senior Clerk, was appointed Secretary of Busselton Hospital and resigned from the Sanatorium staff in October. He carried with him our best wishes for success in his new appointment.

LABORATORY.

Mr. E. Doilov, the Senior Technician, has maintained a high standard of efficiency throughout the year, and in addition to routine laboratory investigations, has continued research into the comparative merits of various methods of investigation of suspect materials. A summary of laboratory investigations is as follows :—

Sputum Examinations—	
Direct	2,192
Concentration	1,543
Cultures on Loewenstein-Jensen Media—	
Sputum	3,835
Gastric contents	309
Laryngeal swabs	731
Pleural fluid	89
Urine	129
Faeces	13
Miscellaneous	30
Guinea Pigs Inoculated	30
General Examinations—	
Urine	406
Faeces	52
Pleural fluids	42
Miscellaneous discharges	39
Agar Cultures for Secondary Organisms—	
Sputum	163
Throat swabs	20
Pleural fluids	94
Urine	317
Faeces	41
Miscellaneous discharges	95
C.S.F.	3

Antibiotic Sensitivity Tests	295
Anti-tuberculous Resistance Tests—	
(Streptomycin, Isoniazid and P.A.S.)	55
Haematological—	
Haemoglobin estimations	211
Red cell counts	95
Differential white blood counts	300
Bleeding and clotting times	28
Sedimentation rates	97
Pro-thrombin times	47
Biochemical—	
Blood sugar estimations	77
Test meals	10
Bromsulphalein excretion tests	44
Skin Scrapings—	
Hansen's disease	18
Others	25
Post Mortem Examinations	19
Sections Prepared (post-mortem)	315
Preparation of Culture Media—	doz.
Loewenstein-Jensen media	1,915
Loewenstein antibiotic media	72
Liquid charcoal media	40

X-RAY.

Early in the year the main X-ray table and tube stand were replaced by a more modern, reconditioned table and stand with ceiling and ground rails and a new automatic switch over, and a new tomographic attachment, and this improved equipment has facilitated appreciably the work of the technician, Mr. D. Griffiths, who has continued to maintain an efficient standard of radiography. Details of radiological examinations during the year are as follows :—

Chests (P.A. and Lateral)	3,497
Tomograms	208
Bronchograms	39
Extremities	185
Spine and pelvis	148
Sinuses and skulls	21
Abdomens	21
Barium meals	24
Cholecystograms	12
Pyelograms—Intravenous	9
Retrograde	1
Dental X-rays	133

REHABILITATION.

Again the effect of early diagnosis by mass radiography, and the consequent more effective control of the disease by drugs and surgery, has been felt in the field of rehabilitation, considerably fewer patients requiring major changes of occupation by virtue of their disease. Nevertheless at regular intervals the individual problems of every patient have been considered by the rehabilitation committee consisting of medical officers, the rehabilitation officer, the social worker and the occupational therapist. The education and training officer of the Social Services Department, Mr. A. E. Perry, has visited the Sanatorium regularly to discuss with us the problems of patients requiring vocational training and placement in industry, and to interview those patients and thus commence a liaison which continues after their discharge from hospital until their return to work. Details of the rehabilitation activities of Mr. Perry are as follows :—

Patients placed in employment after training	38
Commenced training during 1957	16
Currently training as at 31st December, 1957	16
New cases seen	35
Enrolled in Migrant English	6
Enquiries on behalf of patients with regard to future employment	13

LINLEY VALLEY COLONY (T.B. Association of Western Australia).

During the year 12 ex-patients were employed on a part-time basis in the sheltered workshop or on the orchard at Linley Valley, one was employed full-time as manager of the orchard, and one on general maintenance and painting of the houses and factory. On 31st December, 1957, there were 12 ex-patients still in employment. A considerable amount of further work was done in establishing pasture and fencing the property, and 200 sheep were procured towards the end of the year.

The tinsmithy still has considerable difficulty in finding suitable markets for its products, and this interferes with its function as a medium of rehabilitating permanently incapacitated patients. Nevertheless despite its limitations in this regard it has continued to keep in employment a number of patients who are unfit for full-time work and would run the risk of relapse on return to the general labour market.

OCCUPATIONAL THERAPY.

Under Miss Elizabeth Adam the Occupational Therapy Department provided diversional therapy for all interested patients, and assisted materially in the maintenance of patient morale. Miss Joan Bradshaw joined the staff in August and has been of considerable assistance.

ART THERAPY.

Mr. Guy Grey Smith rejoined the staff as art therapist early in the year and his influence was evident by a marked increase in the interest of patients generally, in both art therapy and pottery.

SOCIAL SERVICE.

Miss G. Paddon has played a major part in the solution of patients' social problems. Every patient was seen on admission, and details of her activities are as follows :—

State Housing Commission—	
Applications	19
Allocations	14
Transfers	6
Financial Assistance—	
Tuberculosis Allowance Applications	101
Invalid Pensions	1
Sickness Benefit	11
Workers' Compensation	5
Mine Workers' Relief	1
Payments on behalf of Native Welfare Department	193
Payments on behalf of Progress and Pastimes Club	153
Others	13
Domestic Problems	11
Child Placement (including group placements)	5
Domestic Help	2
Welfare of Native Patients (enquiries and action)	25
Travel Arrangements	28
Accommodation	6
Home Visits	33
Royal Perth Hospital Visits	35
Other Institution Visits	8
Admissions to Other Institutions	4
Personal Service	165
Miscellaneous Enquiries	534

AMENITIES.

In addition to pictures held in the Recreation Hall twice a week, programmes of 16 millimetre films have been shown in the wards during the year consisting of feature programmes for the most part, interspersed with educational films through the courtesy of the Visual Education Department. In addition a number of concert parties have contributed to the entertainment of the patients, and we are grateful to the rehabilitation and amenities officer, Rev. W. A. Kerr, for arranging for these parties.

VITAL STATISTICS.

Admissions.

Male	156
Female	83
Total	239

Method of Discovery.

Mass Miniature Radiography—	
Metropolitan	37
Country	42
Private Practitioners via Perth and Fremantle Chest Clinics—	
Metropolitan	23
Country	41
Private Practitioners via Perth Radiological Clinic	5
Referred from Royal Perth Hospital	29
Other Institutions	3
Perth Chest Clinic (follow-up of suspects, migrants, and contacts, and pre-employment X-rays)	40
Fremantle Chest Clinic	3
Kalgoorlie Chest Clinic	16

Of the 239 admissions, 198 were regarded as suffering from pulmonary tuberculosis, nine from extra-pulmonary disease and 32 from other conditions, as listed below :—

Non-specific pneumonia	6
Staphylococcal pneumonia and empyema	1
Lung abscess	5
Bronchiectasis	8
Carcinoma of the lung—	
Primary	5
Secondary carcinomatosis	1
Sarcoidosis	2
Miscellaneous conditions	4

Re-admissions.

Fifty-three patients were re-admitted, including one male on three occasions and two elderly females twice re-admitted during the year for assessment and treatment of intercurrent infections. Of these 53 admissions 28 only were related to tuberculosis, the remaining 25 cases being admitted for other causes. An analysis of the tuberculous and non-tuberculous re-admissions is as follows :—

Tuberculosis.

Chronic sputum-positive cases returning after extended leave, or from other institutions	4
Relapse of previously controlled disease (natural history) (no previous chemotherapy) :	
6 to 10 years following previous discharge	3
11 to 20 years following previous discharge	2
40 years following previous discharge	1
Total	6
Relapse of previously controlled disease (previous drug therapy in varying amounts) :	
2 to 5 years	6
6 to 8 years	2
Total	8
Infected plomb space (tuberculosis arrested)	1
Silicotuberculosis	3
Environment (particularly alcoholism) coupled with other factors	2
Senile cases returning after trial home treatment	1
Previous irregular discharges persuaded to return	3
Total	6

Non-tuberculous Re-admissions.

Chronic bronchitis (acute exacerbation)	3
Of these one was re-admitted twice and another three times.	
Spontaneous pneumothorax	1
Cardiac failure associated with pulmonary fibrosis and other causes	7
Carcinoma of lung (old tuberculosis inactive)	2
Re-admitted for review and assessment (tuberculosis inactive)	7
For investigation	3
Severe rheumatoid arthritis associated with inactive tuberculosis	1
Post-operative convalescence after pneumonectomy (inactive tuberculosis with gross bronchiectasis	1

Discharges.

Total number of discharges		308
Short-term patients (investigation and symptomatic treatment, transfers to other hospitals, and irregular discharges within three months of admission)	88	
Long-term patients	220	
Average length of stay in hospital of long-term patients		46 weeks

Irregular Discharges.

Eight patients actually absconded and one other was summarily discharged on his return to the Sanatorium after being absent without leave for five days. This patient had had 65 weeks treatment in hospital, his sputum was consistently negative, and his disease considered arrested. Of the eight patients who actually left without notice, it is interesting to note that seven were natives, four having been admitted following the survey of a bush tribe in Laverton. Fifteen other patients for various reasons did not remain in hospital for the advised period and are regarded as " irregular " discharges. Of these, however, in only one was the sputum positive and the disease not adequately controlled, and he was permitted to go home for treatment following a domestic tragedy shortly after his admission. Nine of the fourteen spent periods in the Sanatorium of six months or longer, and their disease was regarded as arrested.

Six sputum positive patients were discharged, including three after prolonged periods in hospital with continued failure to convert their sputum, one aged migrant, positive on culture only, after a short term of Sanatorium treatment, and one elderly woman with associated carcinomatosis who was too ill to return to the Sanatorium after Christmas leave. The home conditions of all positive cases were considered satisfactory.

Deaths.

There were 23 deaths in the Sanatorium and of these five were regarded as the direct result of their tuberculosis. In six others tuberculosis played a contributory part, and in the remaining 12 it was considered to play no part in the cause of death, which was carcinoma of the lung in four cases, and cardiac failure in eight cases.

Hansen's Disease (*Leprosy*).

Throughout the course of the year five cases were treated for Hansen's disease, all except one being discharged before the end of the year, the only remaining patient having been in hospital continuously since 1936 with gross disease affecting practically all parts of his body.

CONCLUSION.

In concluding this report I desire to express my appreciation to my medical officers, to the nursing and clerical staff and to all other members of the Sanatorium staff for their continued loyalty, friendship and devotion, which have so facilitated the administration of the institution and made it a pleasant duty. It is a pleasure also to record my appreciation of your own personal help and guidance and the continued co-operation of the members of your staff at the Chest Clinic. We are well aware of the interest shown in the institution by the Commissioner of Public Health, the Under Secretary and Assistant Under Secretaries for Health, and we are grateful to them and to the staff of the Public Health Department for their assistance at all times.

H. R. ELPHICK, M.B.B.S., M.R.C.P., M.R.A.C.P.,
Medical Superintendent.

Appendix V (a)

State of Western Australia.

PULMONARY TUBERCULOSIS NOTIFICATIONS FOR THE YEAR ENDING 31st DECEMBER, 1957. SHOWING AGE, SEX, FORM AND STAGE OF DISEASE.

Age Group.	Males.					Females.					Persons.				
	Pulmonary.			Pleural Effusion.	Total.	Pulmonary.			Pleural Effusion.	Total.	Pulmonary.			Pleural Effusion.	Total.
	Min.	Mod.	Adv.			Min.	Mod.	Adv.			Min.	Mod.	Adv.		
0– 4	....	1	....	....	1	....	2	....	....	2	....	3	....	....	3
5– 9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
10–14	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
15–19	....	....	....	....	....	1	2	....	....	3	1	2	....	....	3
20–24	2	2	1	....	5	2	4	....	....	6	4	6	1	....	11
25–29	7	6	3	1	17	5	3	....	....	8	12	9	3	1	25
30–34	8	8	4	....	20	5	8	....	....	13	13	16	4	....	33
35–39	3	14	6	1	24	6	8	....	....	14	9	22	6	1	38
40–44	11	13	3	3	30	2	6	4	....	12	13	19	7	3	42
45–49	6	16	3	....	25	1	4	2	....	7	7	20	5	....	32
50–54	4	9	8	....	21	3	6	1	....	10	7	15	9	....	31
55–59	12	15	7	....	34	4	....	....	....	4	16	15	7	....	38
60–64	7	13	7	....	27	1	2	....	....	3	8	15	7	....	30
65–69	3	13	3	....	19	4	1	....	....	5	7	14	3	....	24
70–74	2	3	5	1	11	1	1	....	....	2	3	4	5	1	13
75–	1	2	4	....	7	1	1	....	....	2	2	3	4	....	9
N./S.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	66	115	54	6	241	36	48	7	....	91	102	163	61	6	332

Appendix V (b)

State of Western Australia.

TUBERCULOSIS CASE REGISTER AS AT 31ST DECEMBER, 1957, SHOWING AGE, SEX, FORM AND STAGE OF DISEASE.

Age Group.	Males.					Females.					Persons.					Total.
	Pulmonary.			Non Pulm. T.B.	Pleural Effusion	Pulmonary.			Non Pulm. T.B.	Pleural Effusion	Pulmonary.			Non Pulm. T.B.	Pleural Effusion	
	Min.	Mod.	Adv.			Min.	Mod.	Adv.			Min.	Mod.	Adv.			
0– 4	3	3	....	9	....	2	2	....	13	....	5	5	....	22	....	32
5– 9	10	1	1	5	....	10	3	1	15	....	20	4	2	20	....	46
10–14	5	2	1	7	1	4	1	1	5	....	9	3	2	12	1	27
15–19	1	1	1	3	....	4	8	3	4	1	5	9	4	7	1	26
20–24	15	14	2	5	1	21	22	....	2	3	36	36	2	7	4	85
25–29	29	36	11	7	5	39	32	6	6	4	68	68	17	13	9	175
30–34	66	77	18	9	1	55	77	14	8	1	121	154	32	17	2	326
35–39	54	89	18	5	4	64	70	11	3	1	118	159	29	8	5	319
40–44	63	103	29	6	3	42	71	20	3	3	105	174	49	9	6	343
45–49	60	119	29	6	1	18	52	21	4	1	78	171	50	10	2	311
50–54	35	142	51	3	2	21	41	12	7	....	56	183	63	10	2	314
55–59	44	134	52	6	4	17	39	11	2	2	61	173	63	8	6	311
60–64	25	108	32	....	1	8	17	9	1	....	33	125	41	1	1	201
65–69	24	94	38	3	1	10	21	3	2	....	34	115	41	5	1	196
70–74	15	52	27	....	....	4	16	5	....	....	19	68	32	....	....	119
75–	14	37	28	3	1	4	12	3	....	....	18	49	31	3	1	102
N./S.	1	....	....	2	....	....	4	....	2	....	1	4	....	4	....	9
Total	464	1,012	338	79	25	323	488	120	77	16	787	1,500	458	156	41	2,942

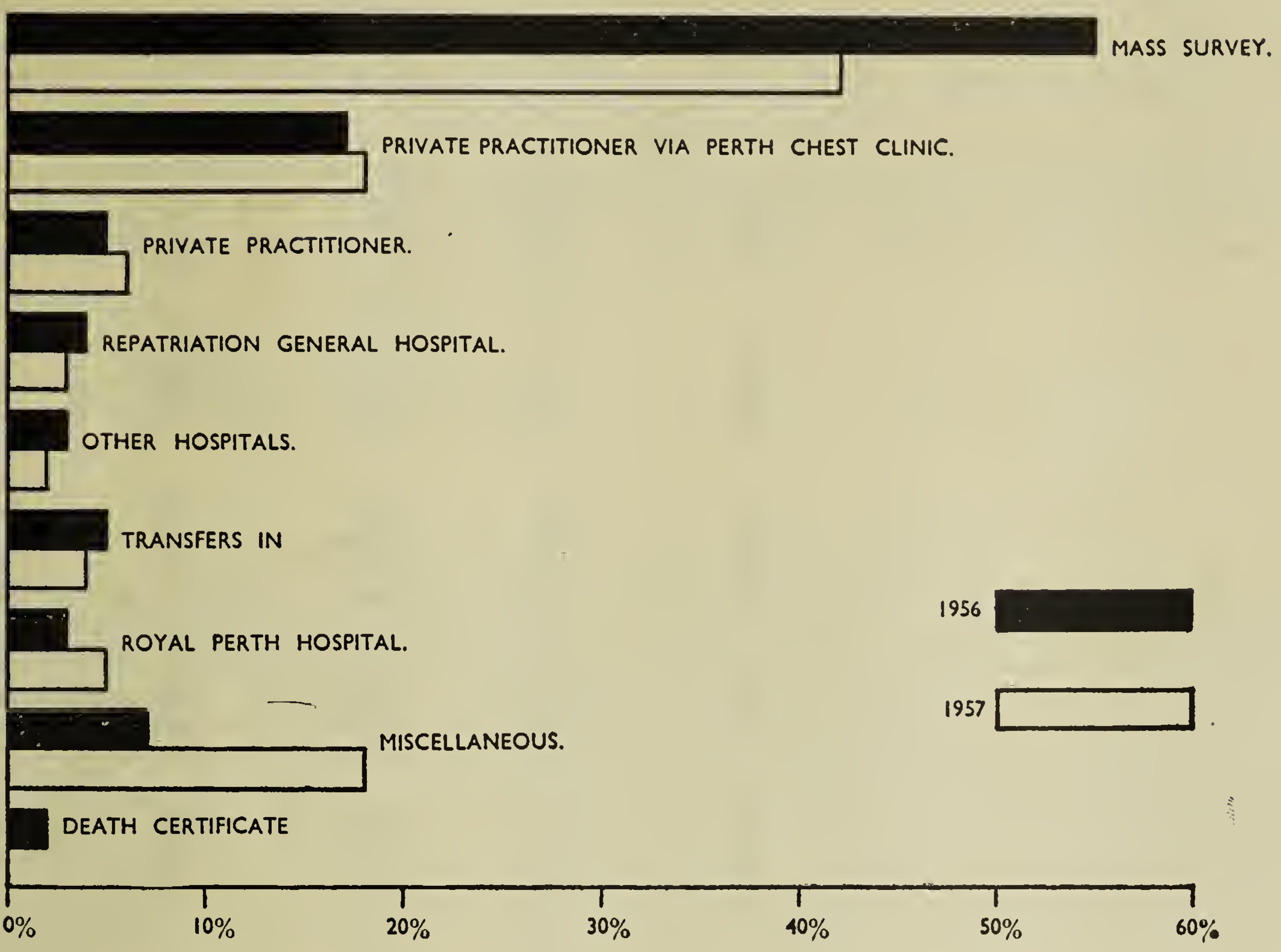
Appendix V (c)

The supervision of the Register as at 31st December, 1957, is as follows :—

Perth, Fremantle and Kalgoorlie Chest Clinics	1,531
Repatriation Commission	762
Wooroloo Sanatorium (includes out-patients)	219
Claremont Mental, Royal Perth Hospital, and other hospitals	156
Private Practitioners (including country T.B. Officers)	274
Total	2,942

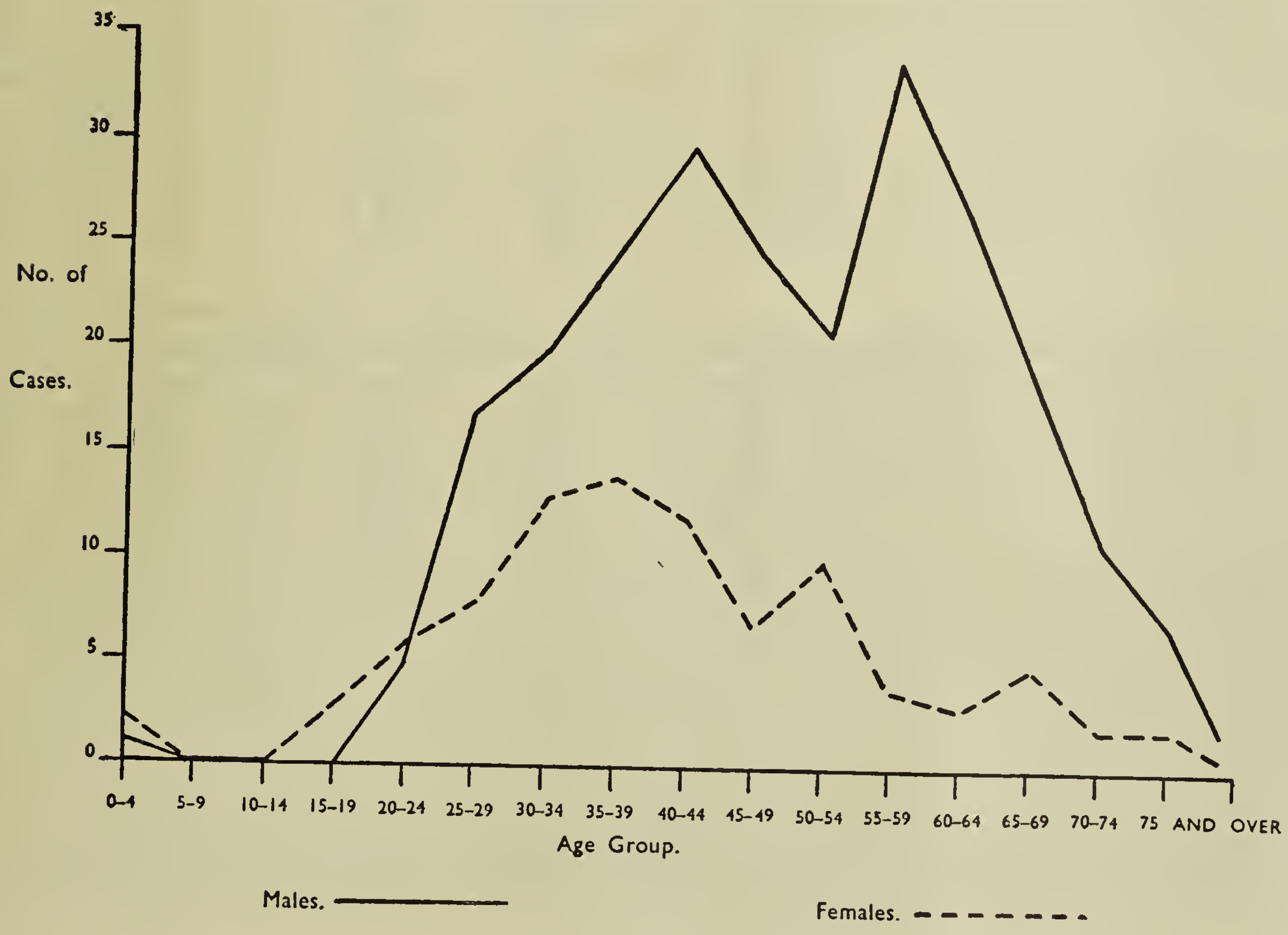
Appendix V (d)

GRAPH SHOWING THE SOURCE OF NOTIFICATION OF CASES OF PULMONARY TUBERCULOSIS AS PERCENTAGE OF TOTAL NOTIFICATIONS 1956 AND 1957



Appendix V (e)

GRAPH SHOWING AGE DISTRIBUTION OF PULMONARY TUBERCULOSIS NOTIFIED IN 1957



Appendix VI

Western Australia

PULMONARY TUBERCULOSIS

Year.	Population in 1,000s.	Notifications Received.	Incidence Rate per 100,000 Population.	Deaths Registered.	Mortality Rate per 100,000 Population.
1911	287	259	90·2	190	66·2
1912	301	429	142·5	220	73·1
1913	313	424	135·5	206	65·8
1914	323	353	109·3	229	70·9
1915	321	336	104·7	233	72·6
1916	313	511	163·5	225	71·9
1917	306	464	151·6	217	70·9
1918	308	432	140·5	245	79·5
1919	320	467	145·9	289	91·6
1920	330	442	133·9	259	78·4
1921	334	424	126·9	277	82·9
1922	341	387	113·8	256	75·1
1923	351	361	102·8	216	61·5
1924	363	381	104·6	228	62·8
1925	373	403	108·4	259	69·4
1926	381	415	108·2	252	66·1
1927	392	409	104·3	231	56·4
1928	408	395	96·8	282	69·1
1929	421	400	95·0	245	53·4
1930	429	569	132·6	218	50·8
1931	432	372	86·1	223	51·6
1932	435	339	77·9	203	46·7
1933	439	295	67·2	207	47·2
1934	442	287	64·9	218	49·3
1935	447	270	60·4	210	47·0
1936	452	338	74·8	193	42·7
1937	457	239	53·0	172	37·6
1938	464	247	53·2	177	38·1
1939	470	202	43·0	179	38·1
1940	473	231	48·8	181	38·3
1941	474	154	32·5	185	39·0
1942	477	113	23·7	175	36·7
1943	477	273	57·3	144	30·2
1944	481	219	45·4	134	27·9
1945	488	271	55·5	149	30·5
1946	493	343	69·6	163	33·1
1947	502	372	74·0	128	25·4
1948	515	325	63·1	157	30·5
1949	533	499	93·6	123	23·1
1950	558	586	104·8	129	23·1
DEATH CLASSIFICATIONS ACCORDING TO 6TH (1948) INTERNATIONAL LIST.					
1950	558	586	104·8	125	22·4
1951	580	467	80·4	76	13·1
1952	601	508	84·4	75	12·5
1953	621	378	60·6	43	6·92
1954	640	348	54·3	57	8·9
1955	659	413	62·7	31	4·7
1956	677	424	62·6	43	6·3
1957	692	332	47·9	36	5·2

Appendix VII

REPORT BY THE DIRECTOR OF EPIDEMIOLOGY

The outstanding features of the year under review were the obliteration of poliomyelitis as a public health problem, and the reduction of diphtheria to the lowest level on record. There was also some reduction in the reported intestinal infections and certain other diseases. The only notable epidemic of the year was Asian influenza, the extent of which was indicated by voluntary notification.

Assistance from the laboratory was again of inestimable value in the investigation and control of the bacterial diseases ; while the accomplishment of Professor Stanley in establishing the beginnings of a Virus Unit augurs well for the future. His recovery of Asian virus from local material is especially noteworthy for it represents the first virus isolation achieved in this State.

The Poliomyelitis Immunisation Unit again distinguished itself by attaining all its objectives, maintaining maximum efficiency, and administering 400,000 doses of Salk vaccine provided by the Commonwealth Serum Laboratories. The unit functioned with clockwork precision and has established a record of speed and efficiency which would be difficult to surpass under comparable conditions anywhere in the world.

The following topics warrant extended comment :—

1. Poliomyelitis immunisation.
2. Diphtheria.
3. The epidemic of Asian influenza.

I—POLIOMYELITIS IMMUNISATION

It will be recalled that the Poliomyelitis Immunisation Project began on 2nd July, 1956, with a monthly allocation of 30,000 doses of vaccine from the Commonwealth. The initial objective was the protection with three injections, of the 194,750 children enumerated within the State at the 1954 Census ; and it was anticipated that the objective could be attained within two years. By the end of 1956 over 97,000 children had received two doses and a further 7,000 had received one dose of the vaccine.

Throughout 1957 inoculations were administered as fast as supplies of vaccine allowed and the mobile units fulfilled their commitments in successive areas according to plan. By the end of the year 127,853 children had completed the full course of three injections, and over 70,000 others had received either one or two doses. Indeed the total of children inoculated (199,135) exceeded the number enumerated at the census three years previously. It is therefore impossible to compute an accurate " acceptance rate " but it is clear that virtually the entire child population has been inoculated. Details of immunisation recorded are as follows :—

SALK VACCINATIONS : 1/7/56 to 31/12/57

Age Group	3 Injections	2 Injections	1 Injection	1, 2 or 3 Injections	Population (At last Census in 1954)
Under 15	127,853	67,647	3,635	199,135	194,750
Over 15	15,937	32,439	4,455	52,831	445,021
All Ages	143,790	100,086	8,090	251,966	639,771

Poliomyelitis Prevalence in Relation to Salk Vaccination

From 1913 (when official records of poliomyelitis prevalence were introduced) to 1937, an average of about seven cases a year were notified. In 1938 an outbreak of some 50 cases occurred ; and from 1939–1947 the sporadic prevalence of about seven per annum was resumed. In 1948 the first major epidemic occurred and 311 cases were recorded. During the next five years the average annual number was 59, and in 1954 a second epidemic of 436 cases occurred. In 1955 there were 33 cases, and before June 30, 1956, a third epidemic of approximately 400 cases was registered.

Salk vaccination was introduced on 2nd July, 1956, and during the rest of that year seven provisional poliomyelitis notifications were received. The diagnosis of one of these was subsequently changed and full details concerning the remaining six were submitted to the Federal Poliomyelitis Surveillance Committee for assessment. Only two were accepted as being certainly due to poliomyelitis, the remaining four being regarded as due to some other condition. During 1957 a further seven provisional notifications were received and assessed in due course by the Federal Committee. Only three of these were regarded as being true poliomyelitis. All these five cases were among unvaccinated persons and three of them were adults. *Thus, during the 18 months subsequent to the inception of Salk Vaccination only five confirmed cases of poliomyelitis were recorded in the State, which represents a prevalence lower than any experienced since poliomyelitis became a major public health problem ten years ago.* While it may be too early to assess the full protective value of Salk vaccination, it is difficult to avoid the conclusion that the main reason for this dramatic reduction in prevalence of the disease is the fact of widespread vaccination.

Details of poliomyelitis incidence recorded are as follows :—

POLIO INCIDENCE : W.A.—Before and After Salk Vaccination

Year	Paralytic	Other	Total	Deaths
1948	Type of disease not specified, but all or nearly all probably paralytic		311	24
1949			61	6
1950			59	5
1951			94	4
1952			37	2
1953	39	5	44	3
1954	198	238	436	4
1955	22	11	33	2
1/1/56 to 30/6/56	171	228	399	14
1/7/56 : MASS SALK VACCINATION BEGAN				
1/7/56 to 31/12/56	1*	1*	2*	*Nil*
1957	3*	....	3*	*Nil*

* Not vaccinated.

General Administration

The campaign was conducted throughout 1957 on the same basis as previously, utilising four mobile clinics and a few stationary clinics organised with the collaboration of selected local authorities. The mobile clinics have moved progressively from zone to zone throughout the southern parts of the State ; and special additional trips were undertaken in certain cases to cater for groups who missed one or other of their three injections. People in the north-west portion of the State have been immunised by medical officers of the North-West Service, and in two areas Flying Doctor facilities were used to advantage.

During the school vacations when children were not available for group vaccination, arrangements were made to immunise selected adult groups such as university undergraduates, teacher trainees, postal workers, policemen, railway employees, shop assistants and similar groups in constant contact with the public. In all these cases clinics were taken to the employees' place of work, and acceptance rates generally exceeded 80 per cent. In a few instances where suburban clinics were arranged mainly for the benefit of housewives, the local response was disappointing and barely 50 per cent. of adults in the area attended the clinics. To some extent this may have been due to insufficient publicity, but the main reason might be that many adults are unwilling to attend clinics more than a very short distance from their homes or places of work. The policy has therefore been adopted of taking a clinic to any location where 50 or more adults can be assembled without undue inconvenience; and where this principle has applied a maximal acceptance rate has been obtained. It seems clear that if the Adult Immunisation Campaign is to achieve its purpose then no effort must be spared to make it as easy as possible for people to receive their inoculations, and self-equipped mobile teams must be prepared to visit a very large number of centres. The permanent stationary clinic has a useful function to perform, but its main purpose should be to cater for those who miss one or more of their injections at other places.

During the year a total of 437,000 doses of vaccine were used. The four mobile clinics administered the great majority of these injections. The " far country " unit visited 234 schools, missions and hospitals and travelled 19,500 miles. The " near country " unit visited 273 schools and covered 16,600 miles. The performance of these two units in adhering to schedules despite mechanical breakdowns and other unforeseen difficulties is quite remarkable. The two metropolitan units together visited 432 schools and travelled 11,800 miles.

Experience supports the conviction that the campaign could never have been conducted effectively without the aid of these mobile units. The headquarters of the Poliomyelitis Immunisation Unit in Stirling Street has developed a central clinic which conducted 126 sessions during the year, and over 18,000 people took advantage of the special facilities provided. Medical officers in the North-West Service used 5,200 doses for children and expectant mothers, while officers of the Infant Health Service included Salk Vaccination in their responsibilities along the W.A.-S.A. Section of the Trans-Australia Railway. Voluntary aides from the Red Cross Society rendered invaluable assistance in the metropolitan area and officers of the Education Department contributed in a large measure to the success of the project.

Commentary

Initial results indicate that the Poliomyelitis Immunisation Campaign is already an outstanding success. From the professional point of view it has been a most rewarding experience, and from the administrative viewpoint it has been very gratifying to see months of careful preparation culminate in the smooth execution of plan carried out with maximum public support and universal benefit. Would that all preventive endeavour were attended by the same good fortune.

II—DIPHTHERIA

For many years diphtheria in endemic form has exacted an irregular toll from the community. This has been largely preventable and it has been repeatedly emphasised that the only measure which will prevent it, is artificial immunisation. During the post-war years efforts to stimulate the interest of parents in this measure produced no dramatic results although there appeared to be a gradual increase in the number of immunisations carried out both at local authority clinics and privately. A little more than two years ago, however, a combination of two factors led to the advantages of immunisation being brought into the limelight, and the demand for infant immunisation intensified beyond all expectation. The two factors concerned were :—

1. The establishment of the Health Education Council, whose influence has extended to all parent groups ; and
2. the Salk Vaccination Campaign, which has served as a constant reminder that immunisation is an indispensable procedure in safeguarding health.

Further, it has been standard policy to advise parents to have their children immunised against diphtheria before presenting them for poliomyelitis vaccination. The outcome has been a dramatic increase in the number of diphtheria immunisations, and a resultant fall in the prevalence of diphtheria to the lowest level since accurate records of this disease have been kept. Providing that the interest in immunisation can be sustained, diphtheria will soon be added to the list of infectious diseases which have been virtually eradicated from the community.

III—THE EPIDEMIC OF ASIAN INFLUENZA

Introduction

Influenza remains the one epidemic disease of modern times which periodically occasions alarm in public health circles. Disturbing memories of the 1919 pandemic are still clear in the minds of senior administrators, while the younger are impressed by recorded accounts of it.

The swamping of hospitals, the relative inadequacy of doctors and nurses, the disruption of industry, and the general disorganisation of essential services and routine community life, are prospects which no administration can face with equanimity, let alone the toll of death and human suffering which can involve every family group.

Despite the enormous advances in virology over the last 30 years, this menacing infection with its high attack rate, short incubation period, intense infectivity, dangerous complications, and unpredictable mortality, still defies control. Quarantine, isolation, and general preventative measures are useless. Vaccines of various kinds have been used against it, but an effective immunising agent has yet to be found.

For all these reasons the development and rapid extension of an epidemic in Asia during April and May attracted anxious attention all over Australia. Although preliminary reports indicated that the nature of the disease was comparatively mild, it was evident that influenza on a mass scale in Western Australia could overload existing hospital and medical facilities, and might jeopardise the maintenance of essential services.

A special committee was therefore appointed to assess the problems which might arise and prepare an emergency plan which could be put into operation at short notice if circumstances warranted.

Influenza Committee

This committee met on June 7 and endorsed the following principles which could well be used as a guide for future emergencies of a similar nature.

1. The introduction of a voluntary system of *notification*, whereby all doctors would be requested to submit a weekly return to the Commissioner reporting the number of cases of influenza-like illness seen during the week, together with the number of deaths. This would provide the only practicable measure of the extent, severity, course, and trend of an epidemic.
2. The establishment of an *Emergency Hospital* at the Claremont Showgrounds to accommodate those patients who could not be treated at home. This measure would relieve the strain on general-practitioner and home-nursing services, and ensure that all those afflicted would receive prompt and suitable treatment, and minimise the risk of dangerous complications.
3. The acquirement of such supplies of influenza virus *vaccine* as become available to the State, and its priority administration to hospital personnel and other special groups selected in accordance with their degree of exposure to infection and their relation to essential public services. While the efficacy of the vaccine itself was uncertain, it was thought that even if partially effective, this measure would assist in maintaining essential services.
4. The extension of all activities connected with *Home Nursing* and *Home Help*. These services are conducted mainly by voluntary organisations such as the Red Cross Society, the Silver Chain Nursing Association, and the League of Home Help. The facilities provided by these organisations could clearly be of great value in keeping mildly ill family groups at home, in relieving the pressure on hospitals, and in maintaining the general welfare of the community.

Notifications

A system of weekly notifications was introduced on June 9 and discontinued on October 12. The notifications recorded during the period are set out in Table I. It will be seen that during June an average of about eight influenza-like illnesses were seen each week by individual general practitioners. On the basis of experience in previous years this incidence may be regarded as average for winter in Western Australia. In July a sharp outbreak of about 500 cases occurred in Kalgoorlie, but elsewhere in the State the rate of notification did not rise significantly until the last week in August, when it doubled. Epidemic levels were thereafter maintained for six weeks, and subsided in the middle of October. Altogether, approximately 12,000 cases were notified with 18 deaths, most of these being from staphylococcal pneumonia.

Virus Isolations

Throat washings from a number of Kalgoorlie cases were sent to the Commonwealth Serum Laboratories, Melbourne, where a strain of A type virus conforming to the newly designated A/Singapore/1/57 was identified, while later, in Perth, Professor N. F. Stanley succeeded in recovering identical virus from some 16 local cases (of which two were nurses suffering from mild influenza despite recent vaccination against the disease).

Vaccination

About 5,000 doses of C.S.L. influenza virus vaccine (mixed A and B, incorporating the Singapore strain) were purchased by the Department and issued to some 90 institutions for the priority immunisation of their staffs. These vaccinations began on July 5, but were not completed for several weeks. As has been reported elsewhere, the epidemic began at the end of August, reached its peak in mid-September and subsided in October. A questionnaire was then addressed to all institutions to secure data concerning the prevalence of influenza among their staffs. Data adequate for analysis was obtained in respect of some 4,590 members of the staff at 74 hospitals. Of this number 3,298 accepted vaccination and 549 (16·6 per cent.) subsequently experienced an upper respiratory tract infection indistinguishable from influenza. Of the 1,292 not vaccinated, 325 (25·2 per cent.) contracted influenza. While these combined results seemed to indicate that the vaccine was of some value, evaluation was prejudiced by the following factors :—

1. The vast majority of cases were diagnosed clinically and the precise number associated with Asian virus was unknown.
2. Vaccinations were spread irregularly over some 11–12 weeks prior to the onset of the epidemic.
3. Some vaccinated personnel had suffered from influenza prior to vaccination. others within four weeks following it. Precise figures were not obtainable.
4. Vaccinated groups varied widely in size and pattern.
5. The relative number of vaccinated and unvaccinated groups differed widely.
6. Although widespread in Perth, the disease was irregular in its incidence in the country.

For these reasons the vaccine's performance was re-assessed by examining the records of the three main metropolitan hospitals separately, in addition to the group experience of the 71 smaller hospitals elsewhere in the State. The relevant figures are set out in Table II. It will be seen that at the Royal Perth Hospital there was a slight difference in favour of the vaccine, at the Princess Margaret Hospital experience was against it, while at the Fremantle Hospital, where virtually the entire staff were inoculated two months before the epidemic began, the subsequent incidence of influenza in the vaccinated was 21·4 per cent., which approximates to that of similar but unprotected groups in previous epidemics of influenza. The group experience of the 71 smaller hospitals indicated a higher incidence of influenza among the unvaccinated, and this largely influences the total for all hospitals. Nevertheless, the differences in prevalence in the vaccinated as opposed to the unvaccinated groups are not impressive, and the incidence of influenza in all vaccinated groups is so comparatively high that any protection the vaccine might have conferred was not substantial, and probably not commensurate with the effort and expense involved in its use on a mass scale.

Emergency Hospital

In assessing the number of emergency hospital beds likely to be required, there was very little firm data to go on. Although the reported nature of the disease was mild, attack rates of up to 20 per cent. had been recorded in Asia. If 20 per cent. of Perth's population of 300,000 were affected over a period of twelve weeks, this would mean some 60,000 sick people of whom perhaps 1 in 10, or 6,000 would require hospital treatment. Allowing for an average stay of one week and an epidemic span of twelve weeks, some 500 additional hospital beds would have been required.

Tentative plans were therefore made for the establishment, at short notice, of an emergency hospital of 500 beds, expansible quickly to 1,000 if necessary, and these were to be divided into three equal sections for men, women and children respectively, with a small special section for seriously ill patients.

The essential, proposed function of such a hospital was to provide bed rest, feeding, and simple medical treatment until such time as the patients were able to fend for themselves and return home.

The Motor Pavilion at the Showgrounds measured 268 ft. x 110 ft. (29,480 sq. ft.). On the basis of 50 sq. ft. per bed, with beds 2 ft. apart, and 4 ft. passage ways, this floor area would accommodate 600 beds. Further, the pavilion could easily be partitioned with tarpaulins into several sections, e.g. Males (180), Females (180), Children (180), and Infants (60). If the dimensions of the epidemic warranted, a second emergency hospital unit of about 400 beds could be established in the Centenary Pavilion. Both these buildings were equipped with toilet facilities and were surrounded by smaller buildings which could be utilised for staff accommodation, food services, stores, and other relevant purposes.

Anticipated staff requirements in the first instance were set out as follows :—

(a) Medical (20), i.e., one superintendent, four registrars and 15 resident medical officers.
(b) Nursing (99), i.e., one matron, eight sisters, 30 nurses and 60 student nurses. These would need to be supplemented by 100 volunteers.
(c) Administrative (39), i.e., one administrator, six clerks, three typists, six telephone operators, six social workers, one medical storekeeper, one dispenser, one equipment officer, one food storekeeper, one catering officer, 12 orderlies.
(d) Miscellaneous (30), i.e., one electrician, one carpenter, one transport officer, 15 drivers, six cooks and six cleaners.

Detailed schedules of equipment, drugs, dressings, etc., were also prepared, and where these could not readily be supplied from normal stocks, arrangements were made for emergency supply from alternative sources if required.

Commentary

The effect of all these detailed preparations was that in the event of such an emergency hospital being required, it could have been established within a period of three days. That the occasion did not arise is gratifying, but the experience will be of immense advantage in similar future emergencies that the State is bound to encounter.

Table I

INFLUENZA : W.A.—1957 EPIDEMIC

(Weekly Notifications : June 15–October 12)

	WEEK ENDING	PERTH			ELSEWHERE			ENTIRE STATE			
		Cases Notified	Doctors Notifying	Av. Notns. per Doctor	Cases Notified	Doctors Notifying	Av. Notns. per Doctor	Cases Notified	Doctors Notifying	Av. Notns. per Doctor	Deaths
1	June 15	76	6	12·7	....	2	....	76	8	9·5	....
2	„ 22	283	36	7·9	64	8	8·5	347	44	8·0	....
3	„ 29	292	42	6·9	141	18	7·8	433	60	7·2	....
4	July 6	330	36	9·1	125	26	4·8	455	62	7·4	....
5	„ 13	413	41	10·0	142	31	4·6	555	72	7·7	....
6	„ 20	527	54	9·7	232	23	10·8	759	77	9·9	....
7	„ 27	685	87	7·8	301	28	10·7	986	115	8·6	1
8	Aug. 3	271	28	9·6	241	24	10·0	512	52	9·9	2
9	„ 10	327	38	8·6	249	20	12·4	576	58	10·0	....
10	„ 17	159	25	6·3	189	19	9·9	348	44	8·0	1
11	„ 24	319	33	9·6	137	15	8·4	456	48	9·5	....
12	„ 31	895	52	17·2	225	22	10·2	1,120	74	15·1	....
13	Sept. 7	862	42	20·5	207	19	10·8	1,069	61	17·5	1
14	„ 14	741	38	19·5	417	33	12·6	1,158	71	16·3	4
15	„ 21	1,039	48	21·6	298	19	15·6	1,337	67	20·0	4
16	„ 28	680	27	25·1	398	22	18·0	1,078	49	22·0	3
17	Oct. 5	173	13	13·2	163	11	16·3	336	24	14·0	....
18	„ 12	165	17	9·7	151	10	15·1	316	27	11·7	2
	June 15–Oct. 12	8,237	663	12·4	3,680	350	10·5	11,917	1,013	11·7	18

Table II

EVALUATION OF INFLUENZA VACCINATION : W.A.—JUNE–OCTOBER, 1957

	VACCINATED		UNVACCINATED	
	Number Vaccinated	Number with influenza-like illness subsequent to Vaccination	Number Unvaccinated	Number with influenza-like illness
Royal Perth Hospital	288	67 (23·3%)	470	138 (29·3%)
Fremantle Hospital	359	77 (21·4%)	12	10 (83·3%)
Princess Margaret Hospital	185	57 (30·8%)	50	13 (26%)
71 Smaller Hospitals	2,466	348 (14·1%)	760	164 (21·6%)
All Hospitals	3,298	549 (16·6%)	1,292	325 (25·2%)

Appendix VIII

REPORT BY DR. F. DEBNEY OF THE VENEREAL DISEASES SECTION

The 1957 clinic notifications of gonorrhoea showed a decrease of 20 per cent. on last year's figures, which were 20 per cent. more than those of the previous few years. This fluctuation within comparatively narrow limits would seem to indicate that the " hard core " of the disease had been reached.

Notifications of new cases of syphilis remain at a satisfactory low level, and it is noteworthy that all five cases of the early stage of the disease were either naval personnel or recently discharged members of that service.

A study of the defaulter figures for the clinic shows that with modern methods of therapy, very few persons fail to attend during the treatment period. About 12 per cent. of men default during surveillance, but these are not likely to contribute to the spread of infection, the main source of which is, without doubt, the partially treated woman, professional and otherwise.

To avoid the atmosphere so commonly present in V.D. clinics, an appointment system for women patients has recently been instituted and it is hoped that this might be an encouragement for the more reticent ones to come forward, as well as reducing the defaulter rate.

Unfortunately, the numbers seen at the clinic are only a small representation of the State's total. If more cases were referred to this department by other clinics and by general practitioners in particular, further inroads might be made into the reservoir of infection. Clinic facilities and meticulous efforts in contact-tracing are major factors if a further decrease in incidence is to be effected.

Appendix IX

VENEREAL DISEASE IN WESTERN AUSTRALIA

1956 – 1957

Disease	Male		Female		Total	
	1956	1957	1956	1957	1956	1957
Syphilis—						
Primary	2	4	2	....	4	4
Secondary	2	2	3	4	5	6
Tertiary	1	1	2	2	3	3
Congenital	....	1	....	....	....	1
Total, Syphilis	5	8	7	6	12	14
Gonorrhoea	170	183	18	30	188	213
Chancroid	....	....	....	....	....	....
Granuloma*	....	1	....	4	....	5
Total	175	192	25	40	200	232

* Native

Appendix X

HEALTH OF NATIVES

During the year an attempt has been made to assess the health of the aboriginal by two methods :—

(1) In the North and North-West all admissions to hospital have been recorded and classified.

(2) In the Central area the so-called " desert native " was visited by an expedition and a brief survey carried out in the Warburton-Rawlinson area.

Table I shows the classification of 1,779 natives admitted to hospital in the North and North-West according to the classes of the International List of Causes of Death, with the modification that Class XI is mainly composed of normal births and not complications.

It will be seen that the main diseases are :—

Respiratory	387
Diseases of Digestive System	154
Diseases of Skin and Cellular Tissue	267
Accidents, Poisonings and Violence	235
Disorders of the Nervous System and Sense Organs	117

Certain diseases of interest have been selected from these and tabulated in Table II.

From these two tables we can gain the following information.

The native is prone to respiratory tract infection. This is well known as serious respiratory complications frequently follow influenza, measles, common cold and other similar infections.

Infected skin conditions are common and many of them result from scabies (50). This is in contrast with the survey picture of the " desert native."

Accidents are common as can be expected in a population which includes a large number from the somewhat hazardous occupation of stock boy. Many of the injuries are, however, received in a forceful exchange of opinions during moments of altercation.

Of the 154 diseases of the Digestive System, 115 are accounted for as diarrhoea or gastro-enteritis.

Thirty-nine of the diseases in Class VI are ear infections. This figure does not, however, show the problem in its true magnitude as many cases of otitis media are treated as out-patients. As indicated, the native is prone to upper respiratory tract infection and a common sequela in the native child is middle ear infection. This is a State-wide problem in natives and half-castes and one which shows little signs of being resolved. Results from hospital treatment, with or without mastoid operation, have been disheartening because of subsequent breakdown on return to home conditions. This is a problem which requires serious investigation.

In contrast to the high proportion of these aforementioned diseases, the great killing diseases of white civilization, circulatory and neoplastic, show totals of only 39 and 10 respectively.

Although serological tests of the native population give an indication of treponemal infection of somewhere between 20 per cent. and 30 per cent., only seven cases of yaws are recorded as admitted to hospital, along with five of granuloma and six of syphilis. It would seem that the native treponemal disease, be it yaws or endemic syphilis, is one in which considerable resistance has been developed in the population and late manifestations of a tertiary nature are seldom seen.

If we take anaemia (18), avitaminosis (3) and malnutrition (15) as an indication of dietary deficiency, the total of 36 cases out of 1,779 would suggest that dietary deficiency is not a serious problem and that the native diet as a whole is adequate.

During the year there were 33 admissions or re-admissions to the Derby Leprosarium. This figure corresponds with the average for previous years. There is, however, a gradual change taking place in the type of leprosy being admitted in that the tuberculoid or resistant form is gaining in proportion. As the disease was introduced only about 50 years ago and spread rapidly in a non-immune population, the early years showed a heavy preponderance of lepromatous cases. That preponderance still exists but is much less marked because of a gradual development of herd immunity and the reduction in numbers of susceptibles still unaffected.

The discharges from the Leprosarium for the year were 44 in number—thus we are maintaining the position of the past five years of discharging more than we are admitting. The population within the Leprosarium is therefore constantly diminishing and in the near future will probably stabilize around about 100 inmates for a number of years.

The result of the Warburton area survey was reported in a series of four articles in the Medical Journal of Australia of 26th October, 1957, under the titles :—

" Health and Nutrition of Warburton Range Natives of Central Australia." Davidson, W. S.

" Some Haematological Observations on Aborigines in the Warburton Ranges Area." Davis, R. E., and Pitney, W. R.

" The Serum Proteins of Aborigines in the Warburton Range Area." Curnow, D. H.

" Report on Ophthalmic Findings in Warburton Range Natives of Central Australia." Mann, I.

The general conclusion to be drawn from this survey was that the health of the desert native and his standard of nutrition is good. Trachoma, although prevalent, is marked by an absence of serious sequelae and blindness is rare. Although serological tests gave evidence of treponemal infection in 30 per cent. of the specimens taken, the late manifestations of yaws are rarely seen.

In contrast to the natives of the North and North-West who live in closer contact with the white population, sepsis and intestinal infections are not common among the desert natives. Leprosy was not encountered during the survey and has not been recorded from this part of Western Australia.

The only dietary deficiencies that were apparent were recorded in natives in the vicinity of missions, stations and townships and appeared to be due to a reliance on an ill-balanced selection of white man's food as a replacement for the natural fruits of their desert foraging. This was most apparent in a few cases of mild kwashiorkor seen in infants around the weening age. One or two cases of early scurvy were also seen. None of these defects was present in natives remote from white settlement.

The conclusion to be drawn from these observations is that the native in contact with white populations requires education in the dietary values of white man's food and in the principles of sanitary law if he is to obtain a balanced diet comparable to his native one and is to avoid the diseases which are the result of defective hygiene. He must experience great difficulty in appreciating the need for sanitary laws because the nomadic life the native population previously led, thinly spread over a large area, allowed such laws to be ignored with a great deal of impunity.

W. S. DAVIDSON,
Deputy Commissioner of Public Health.

TABLE I.

CLASSIFICATION OF DISEASES

Hospital	Class I	Class II	Class III	Class IV	Class V	Class VI	Class VII	Class VIII	Class IX	Class X	Class XI	Class XII	Class XIII	Class XIV	Class XV	Class XVI	Class XVII	Miscell-aneous	Total
	Infective and Parasitic Diseases	Neoplasms	Allergic Endocrine System Metabolic and Nutritional Diseases	Diseases of the Blood and Blood Forming Organ	Mental Psychoneurotic and Personality Disorders	Disorders of the Nervous System and Sense Organs	Diseases of the Circulatory System	Diseases of the Respiratory System	Diseases of the Digestive System	Diseases of the Geito-Urinary System	Complications of Pregnancy, Childbirth and the Puerperium	Diseases of the Skin and Cellular Tissues	Diseases of the Bones and Organs of Movement	Congenital Malformations	Certain Diseases of Early Infancy	Symptoms, Senility and Ill-defined Conditions	Accidents, Poisoning and Violence		
Roebourne	1	....	2	1	....	5	....	18	8	....	17	31	5	....	....	1	11	1	101
Broome	34	2	4	7	2	18	6	128	45	17	55	39	4	....	4	10	95	....	470
Derby	31	6	9	8	1	30	15	126	59	9	38	103	22	....	4	4	57	....	522
Port Hedland	7	1	6	2	2	11	5	32	17	8	24	23	6	1	6	6	9	....	166
Mt. Magnet	....	....	....	....	....	41	5	59	....	....	35	51	....	....	27	19	63	28	328
Wyndham	26	1	5	3	....	12	8	24	25	5	44	20	7	....	....	5	....	7	192
Total	99	10	26	21	5	117	39	387	154	39	213	267	44	1	41	45	235	36	1,779

Table II

SELECTED DISEASES : DISTRIBUTION

	Gastro-Enteritis	Diarrhoea	Yaws	Granuloma	Scabies	Anaemia	Avitaminosis	Malnutrition	Ear Infection	Syphilis	Gonorrhoea	Total
Roebourne	6	....	....	....	10	1	....	....	3	....	....	20
Broome	....	27	2	....	3	6	....	10	4	6	3	61
Derby	32	14	1	4	36	9	2	3	7	....	....	108
Port Hedland	3	1	....	....	1	....	1	1	....	....	....	7
Mt. Magnet	27	....	....	....	....	....	....	....	25	....	....	52
Wyndham	5	....	4	1	....	2	....	1	....	....	4	17
Total	73	42	7	5	50	18	3	15	39	6	7	265

Appendix XI

WESTERN AUSTRALIA

DERBY LEPROSARIUM

Admissions and Discharges for the Year 1957, compiled from Monthly Returns of the Superintendent

Month of Year 1957.	Admissions.							Discharges.											Inmates Remaining in Leprosarium.		
	Males.			Females.			Total Ad-mitted.	Males.					Females.					Total Dis-charged.	Males.	Females.	Total Remain-ing.
	Ad-mitted.	Re-Ad-mitted.	Total Males.	Ad-mitted.	Re-Ad-mitted.	Total Females.		Dis-charged Cured.	De-ceased.	Ab-sconded.	Dis-charged Non-In-fectious.	Total Males Dis-charged.	Dis-charged Cured.	De-ceased.	Ab-sconded.	Dis-charged Non-In-fectious.	Total Females Dis-charged.				
January	....	....	....	1	....	1	1	....	....	3	....	3	....	....	....	....	....	3	122	74	196
February	1	2	3	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	125	74	199
March	....	....	....	....	....	....	....	1	....	....	....	1	3	....	....	....	3	4	124	71	195
April	2	....	2	4	1	5	7	....	....	....	....	....	....	1	....	....	1	1	126	75	201
May	3	....	3	1	....	1	4	6	3	....	....	9	9	1	....	....	10	19	120	66	186
June	4	....	4	....	....	....	4	3	....	1	....	4	2	....	....	....	2	6	120	64	184
July	1	....	1	2	2	4	5	....	2	....	....	2	1	....	....	....	1	3	119	67	186
August	....	....	....	1	1	2	2	....	1	....	....	1	1	....	....	....	1	2	118	68	186
September	1	1	2	....	1	1	3	1	....	....	....	1	1	....	....	....	1	2	119	68	187
October	....	1	1	....	....	....	1	1	....	....	....	1	1	....	....	....	1	2	119	67	186
November	....	1	1	1	....	1	2	7	....	....	....	7	2	....	....	....	2	9	113	66	179
December	....	....	....	....	1	1	1	5	....	....	....	5	....	....	....	....	....	5	108	67	175
Total	12	5	17	10	6	16	33	24	6	4	....	34	20	2	....	....	22	56	....	....	....

Analysis of Admissions and Discharges during Year 1957

Inmates as at 31st December	198
Admissions for period ended 31st December	33
Discharges for period ended 31st December	44
Deaths for period ended 31st December	8
Absconded for period ended 31st December	4
Total Remaining at Leprosarium, 31st December	175

Appendix XII

REPORT FROM THE LIBRARIAN, PUBLIC HEALTH DEPARTMENT LIBRARY

To the Commissioner of Public Health

I have the honour to submit a report on the activities of the Library for the year 1957.

The work of the Library has not previously been reported on annually. Accordingly, it is intended to give only a general outline of its functions during the year.

The Library serves the Public Health Department, the Medical Department and, to a small extent, the Chief Secretary's Department. As it would distort the picture to separate that portion of its work that deals with the Public Health Department only, the Library's full work is covered.

The Library is a co-ordinating, purchasing and distributing centre for many sub-libraries. So far as is possible each technical or professional unit attached to either the Public Health or Medical Departments is supplied with reference texts and periodical literature in accordance with policy laid down by the Commissioner several years ago. These units number over 40 and range from country nursing training schools supplied with one nursing journal and a small standard list of about 15 books to such units as the Chest Clinic (10 journals and 128 texts), the State X-Ray Laboratory (16 journals and 80 texts), and the Child Guidance Clinic (19 journals and 106 texts). From the main Library a very considerable circulation of journals is undertaken both locally in the metropolitan area and to distant officers such as the managing secretaries of country hospitals and the school dental officers who are nearly always on the move.

For those sections of the Department where sheer personnel numbers make circulation of periodicals impracticable—such as the Sisters of the Infant Health Service and the School Health Service—a system of issuing Technical Circulars was evolved. These are selected by the Library and, after approval by the head of the section, are edited where necessary and then duplicated and distributed. This system originally started with Health Inspectors but declined with them owing to lack of support and interest. With the Services mentioned, however, the Technical Circulars have been an unqualified success.

With such a wide diversity of interests to cater for, the spread of journals naturally is very wide. As at the 30th June, 1957, the Library was receiving 279 journals. A considerable number of these, however, are not stored in the main library, e.g. those for the State X-Ray Laboratory, Child Guidance Clinic, etc. In order that all sections of the Department may know what non-periodical literature is being received and where it is available, a monthly accession list is issued, showing in detail all such material received during the previous month and its destination. The average monthly receipt of such material during 1957 was 25 items. A copy of the Accession List is sent to all units, to all senior officers of the Department, and to some 30 libraries and individuals outside the Department.

One of the more important aspects of the Library's work is the regular scrutinising of all major journals and, where appropriate, the selection of important articles for perusal by the more senior officers. Similarly, the evaluation and selection of information sources, textual or periodical, in answer to specific queries is a service widely utilised throughout the Department. Preparation of statistical morbidity and mortality tabulations, for State, Commonwealth, or other areas, is occasionally requested. Location and borrowing of wanted reference material is regularly required. In this respect a particular tribute is due to the Barr-Smith Library, Adelaide, whose Librarian, Mr. W. A. Cowan, has consistently and graciously extended to this Library the most willing of helping hands. During 1957 38 items were borrowed from sources outside the State and, of these, the Barr-Smith supplied some 66 per cent. External borrowing within the State comprised 107 items, almost completely from two libraries only, the Medical Library and the Department of Agriculture Library. Loans from the Public Health Department Library to other libraries during the year involved 120 items, and were made to 16 libraries and Government Departments, the largest borrower being the Medical Library.

It is particularly pleasant to record the close co-operation that exists between the Medical Library and this Library. Situated not far apart on opposite sides of the same street, both limited financially in their coverage of material, the two libraries lend to and borrow from each other very freely, co-operate on journal coverage and new purchases and, in general, serve each as a supplement to the other. During 1957, by agreement between the Commissioner of Public Health and the University Librarian, a closer link was forged. As the Medical Library had almost no coverage of public health material and the growth of the new Medical School was creating a demand for it, the Public Health Department Library made available, after its own immediate circulation requirements had been met, each issue in turn of the five major public health periodicals for one month's display in the Medical Library's periodical room.

A considerable portion of the time of the Library staff has, during 1957, been given to supplying information to the Health Education Council which was established early in the previous year. Inevitably as the Council's work expands its calls on the Library must increase at least in proportion.

During 1957 an event occurred of considerable library interest. This was the establishment of another, completely separate, library covering medical subjects, at King Edward Memorial Hospital for Women. Previously this had functioned as a sub-library of the Public Health Department Library. Its requirements had been met as far as possible but financial limitations had been very severe since the K.E.M.H. Library had been only one of many sub-libraries. All texts and periodicals stored at the hospital were, on the Commissioner's instructions, handed over as a basis for the new library, together with good wishes for its future advancement.

The main barrier to full service by the Library is that of its very restricted accommodation. Storage space for new material coming in is almost non-existent. There is no reading space for library users at all. The policy has had to be followed of placing as much material as possible in all sub-libraries, a policy which inevitably severely restricts the availability of information contained in such material, in the main Library. If this problem can be solved soon, and the matter is urgent, the Library can be used, and give service, to its full potential.

JOHN F. WOOLCOTT, M.B., Ch.B.,
Librarian.

Appendix XIII

ABSTRACTS OF CONTRIBUTIONS TO THE LITERATURE BY AUTHORS ASSOCIATED WITH THE DEPARTMENT, 1957

(From the Library)

Davidson, W. S. *The Diagnosis of Leprosy*, Australian Journal of Dermatology, 1957, 4, 90-96.

" This paper does not attempt to bring forward any new aspects of scientific research into the diagnosis of leprosy. It is concerned with an account of certain features of the disease which should be looked for in establishing the diagnosis, the objective being to refresh the memory of the medical practitioner and to impress on him always to bear in mind the possibility of leprosy when dealing with skin or neural lesions, and the need to exclude leprosy before proceeding to a diagnosis."

Davidson, W. S. *Lead Poisoning in Nine Members of a Family*, Lancet, 1957, ii, 1096–7.

" Lead absorption and indications of lead poisoning were found in nine members of a family of 11, living in a galvanised iron shack originally built as a store. Prior to their occupancy the shack had been used for breaking down old car batteries as a preliminary to recovering the lead in them. Lead oxide on the spent cells had been knocked out and left in a heap which the family had spread over the earth floor to even and harden it.

A discussion is given on the correlation between laboratory and X-ray findings and symptomatology of the members of the family who were affected in varying degrees."

Davidson, W. S. *Health and Nutrition of Warburton Range Natives of Central Australia.*

Davis, R. E. and Pitney, W. R. *Some Haematological Observations on Aborigines in the Warburton Ranges Area.*

Mann, I. *Report on Ophthalmic Findings in Warburton Range Natives of Central Australia.* Medical Journal of Australia, 1957, ii, 601–5, 605–8, 610–12.

" To obtain information about the incidence of disease and to ascertain the state of nutrition in Central Australian aborigines, a medical survey was carried out in the Warburton Range area of Western Australia.

" All natives were examined at places where there was no shortage of water. Haemoconcentration from dehydration did not therefore affect the haematological and biochemical results. The clinical and laboratory findings do not indicate any lack of food or shortage of first-class protein.

" There is some evidence that, in common with other peoples living under primitive conditions, these natives have a lack of suitable dietary supplements during and immediately after the weaning period.

" Yaws and trachoma, although prevalent, rarely cause incapacity. There seems to be a relative freedom from sepsis and from evidence of intestinal infection, despite extremely poor sanitary habits and poor appreciation of hygiene.

" High serum gamma globulin and vitamin B_{12} levels and the frequent eosinophilia require further investigation.

Edwards F. G. B., Harris, K. W. H. and Slade, S. E. *Six Year Follow-up Mantoux Survey of Aborigines in Western Australia*, Medical Journal of Australia, 1957, ii, 383–4.

" In 1950 an epidemiological survey of aborigines in the Kimberley and north-west divisions of Western Australia was carried out by Mantoux testing and Chest X-ray examination. Positive reactors were radiologically examined and non-reactors were vaccinated with B.C.G.

" In 1956 a further survey by Mantoux testing alone was carried out in the same divisions and in two other areas. Non-reactors were vaccinated with B.C.G.

" The marked fall found in the Mantoux conversion rate in the unvaccinated younger native groups (including those born since the 1950 survey) was attributed to improved case finding amongst the white and native populations in the areas studied and to B.C.G. vaccination of non-reactors. Of the natives vaccinated six years previously, 51 per cent. were found to be positive reactors."

Mann, Ida. *Probable Origins of Trachoma in Australasia.* Bulletin of the World Health Organisation, 1957, 16, 1165–1187.

" The history of trachoma in Australasia is reviewed ; it is suggested that the disease was not originally endemic in the area, but that it was introduced by European and Chinese settlers, first into Australia and later into New Guinea. From surveys undertaken by the author, and also from those made by others during the past ten years, it is concluded that " pure trachoma " exists all over the area and is still spreading inland from the coast and that it is converted into the serious type of the disease by secondary infection and mechanical irritation."

Appendix XIV

To the Commissioner of Public Health.

Sir,

I have the honour to submit to you a report on the work done by the Infant Health Service (including Pre-School Health) for the year 1957.

During 1957, a total of 26,513 individual babies attended Infant Health Centres throughout the State. Gross attendances at Centres were 217,728.

Home visits paid by Sisters	22,627
Advice by letter	328
Advice by telephone	5,674

CENTRES

The number of Centres in use increased and the position now is as follows :—

	Main Centres	Sub-Centres
Metropolitan	32	85
Country	26	185

Caravans—4.
Stopping places—96.

There are now 99 proper Infant Health Buildings in the State and the following are under construction :—

Bassendean
Belmont (2)
Carlisle
Mt. Lawley
Leederville
Victoria Park

The Centres at Albany and Narrogin, both originally cottages, are being renovated to bring them more nearly into line with modern requirements.

NEW BUILDINGS OPENED IN 1957

Each Local Authority or Committee concerned received a substantial subsidy from the Government to help with the buildings. The Lotteries Commission also contributed a substantial sum towards each building :—

Denmark
Maddington
Manning Park
Merredin
Mingenew
Morawa
Morley Park
Mt. Barker (with Quarters)
Mundaring (with Quarters and garage for Caravan No. 3)
Rockingham (with Quarters)
Waroona

An Infant Health Room attached to the new C.W.A. Centre at Carnamah was also opened.

Perth City Council are building six new Centres at present and discussion has taken place with other local authorities or committees concerning possible Centres at :—

Bellevue
Pingelly
Cowaramup
Geraldton
Mt. Pleasant
Attadale
Willagee
Alexander Park
Osborne Park
Mt. Yokine
Nollamara
Coolbinia
Broome
Mt. Claremont

It has been found necessary to make Doubleview a fulltime Centre with two fulltime Sisters.

The first small £2,000 Centre was opened in September at Morley Park. It is a very compact little building and most convenient for Infant Health work. Owing to the mushroom growth of homes springing up around the City and to lack of suitable halls in these new districts, Sisters are having a trying time finding suitable accommodation in which to hold clinics. In one area up to 40 mothers are being seen weekly at a Chemist's Shop and in another area between 25–35 are being seen weekly in another shop. Chemists in new districts are very sympathetic to Infant Health Work and will often give the Sisters the use of their back premises in which to work. However, the Infant Health Service and the public cannot rely indefinitely on accommodating shopkeepers or on housewives, who frequently lend a room in their houses in which Sisters can hold a Clinic. To overcome this shortage of suitable accommodation for Infant Health and Pre-School work, it will be necessary to build more small Infant Health Centres, otherwise this important branch of Preventive Medicine cannot expand as it should to cope with the ever increasing population in the new housing areas, most of which have no Infant Health Centres at present.

It is fortunate for Infant Health that the Town Planners, with an eye to the future growth of W.A., provided for Infant Health Centre Sites in all the large new housing areas. In some of the older suburbs it is difficult to find sites for Centres.

CORRESPONDENCE INFANT HEALTH AND CORRESPONDENCE MOTHERCRAFT

A third Sister and another typiste were appointed to this section during 1957 as the work is increasing so much.

Many native and halfcaste girls in the North-West take the Correspondence Mothercraft Course in School and the Doctor stationed at Broome has commented on the difference which Mothercraft teaching has made to many of the young coloured women in the district who were Mothercraft Students, and now bring their babies to the " weighing centre " almost weekly. Many more native and half-caste mothers now bring their babies and toddlers to see the visiting Sister.

Next year Correspondence Mothercraft is to be a subject of choice in the Correspondence School Curriculum. This is by arrangement with the Headmaster in charge of Correspondence Education and it is hoped to get a good response.

The following is a summary of the activities of this Branch of Infant Health :—

Births reported	775
New Babies (including those referred from other areas)	350
Individual Babies	628
Pre-School Consultations	700
Letters Received—	
Mothers	903
Others	276
Mothercraft Children's Completed Lessons	2,213
Letters Sent—	
Mothers	3,015
Others	772
Mothercraft Lessons Sent	2,461
Individual Expectant Mothers seen	73
Visits to West Perth Centre—	
Country Babies	199
Country Pre-School	18
Expectant Mothers	15
School Children	135
Telephone Consultations from Country Mothers only	26
" Weighing Centre " Attendances	1,167

During 1957 Sister Philbin made trips throughout the Murchison, Kimberleys and North-West. I accompanied Sister on one trip, visiting Yalgoo, Mt. Magnet, Cue, Meekatharra and Wiluna by car, and including all Native Reserves and some Missions. This was the first occasion on which the Murchison was visited by car and it was a great success. Infants and Pre-School Children were seen and a look out was kept for cases of Trachoma among all age groups.

From Meekatharra we flew North, visiting Wittenoom Gorge, Onslow, Roebourne, Port Hedland, Pardoo, Broome, Derby and Wyndham. Then by launch to Forrest River Mission where we stayed two days and assisted the Flying Doctor when he arrived to give Salk Vaccine to the people at the Mission. We accompanied the Flying Doctor to Kalumbaru where after the children were seen, the doctor was assisted with Polio Immunisation. We then flew with him on his round and saw babies at nearly all the stopping places.

On her second trip, Sister Philbin visited the following places :—

Karalundi
Mt. Magnet
Cue
Meekatharra
Yalgoo
Wittenoom Gorge
Broome
Port Hedland
Derby
Wyndham
Cockatoo Island
Sunday Island
Marble Bar
Nullagine

About three years ago Sister Philbin made an excellent film—" LILY FEEDS A BABY " which, with other films, she shows to appreciative audiences at overnight stops. A total of 1,214 people saw this film this year. It is hoped to produce another teaching film on " EDUCATIONAL DIET " during 1958 again using Native actresses and actors.

MOTHERCRAFT LECTURES

In May, Sister Craig, who had given excellent service as a Mothercraft Lecturer and who was in charge of the Trans Train Car, asked to be given a Suburban Centre. Her place was taken by Sister Mead.

Sister Kerr has had a very successful year with her Parentcraft Lectures, to which there has been a very enthusiastic response. She had three courses each of six lectures at West Perth and one course of six lectures at Fremantle. We are much indebted to Miss Malden of the Kindergarten Training College who gave one lecture in each series.

Sister's Mothercraft Lessons to Expectant Mothers have also been much appreciated. These were held at Cottesloe, Midland Junction, Armadale and Kensington Centres. Each Centre had one series of three lectures. Fifty-three Individual Expectant Mothers received Mothercraft Lessons at West Perth. Mothercraft Lectures were given by Sisters in the Country at places where there are High Schools. These lectures too, have been very successful. The Mothercraft Lecturers at Perth Headquarters set and mark all examination papers.

Sister Kerr visited Shark Bay in May, August, September and October to hold Clinics and give the Salk Vaccine and other immunisation. The Mothercraft Sisters are in great demand to lecture in Mothercraft to Youth Organisations and never stint the help they give. This work is done in the evening and 13 lectures were given during the year.

Sister Kerr prepared the scripts and recorded 38 talks for Broadcasts which are relayed from Geraldton, Kalgoorlie and Albany.

Sister Kerr holds a monthly clinic at Carnarvon in the C.W.A. Rooms and at two Sub-Centres. She also has a " Clinic of the Air " over the " Flying Doctor " network from Carnarvon Base.

Sister Mead gave a series of lectures to the Trainee Nurses at Princess Margaret Hospital and practical examinations were given to the Trainees at the Alexandra Home.

Number of lectures given by Country Sisters	280
Number of lectures given by Mothercraft Sisters	475
Total	755
Number of Country Students	502
Number of Metropolitan Students	1,632
Total	2,134

PRE-SCHOOL HEALTH

Six Sisters were granted Scholarships by the Government to the value of their Salaries and they completed a fulltime 12 week's intensive Pre-School Course. Their results were very creditable. Thirteen Sisters have now completed the Course. Sister Ashton married and was replaced by Sister Hyde.

This section of the work was divided into two Sections towards the end of 1957 :—

1. Dr. Eksteins joined the Staff in September and took over the Medical examination of Pre-School Children at Kindergartens. He is assisted by Sister Silverlock.
2. Sister Hyde continues to do excellent work with Pre-School Children. She visits Infant Health Centres where the Sister-in-charge has not done any Pre-School training. Several of the Sisters who have completed the Pre-School Course conduct Pre-School Clinics at their own Centres at regular intervals.

Pre-School Work done by Dr. Eksteins from September to December, 1957

Number of Kindergartens examined	53
Number of Pre-School Children examined	1,653
Total number notified	837
Number referred for Medical attention	341
Number referred for Home attention	161
Number referred for Dental attention	335
Number of Home Visits paid	90

Pre-School Work done by Sister Hyde

Number of Centres with regular Clinics	33
Number of Children examined	1,408
Number of Broadcasts	16

The work in the Pre-School field is growing rapidly as the public now realises that such a service is available. It will be necessary to increase the number of Pre-School Sisters to two fulltime Sisters next year in order to undertake all the work which is offering in this field.

TRANS TRAIN SERVICE

The work of organising the Trans Train Service was taken over by Sister Mead in June and she was accompanied on each trip by a Sister from the Correspondence Section.

Owing to the fact that the Sisters now do immunisation along the line, the work on the train has grown tremendously, the reason being that the Transline population is a transient one and that there are so many New Australians who have never had their children immunised. It is doubtful whether they would seek immunisation for their children if the Sisters were not at hand to explain the benefits and to persuade these new settlers to have their children immunised. It was found necessary to undertake the double journey in the Welfare Car so that now all work is done in daylight unless the train is held up, when perhaps the children at one or two stopping places might have to be seen by electric light. The School Children along the Transline are examined by the Medical Supervisor of Infant Health once a year.

Another task undertaken by the Train Sisters is the Supervision of cases for the Child Welfare Department.

The Children and Expectant Mothers immunised in September and December, 1956, had their immunisation completed in September 1957. The school children on the W.A. side of the border were examined on this trip.

Five train trips were made in 1957.

	Advice Given		Vaccines Given			Number of People seen
	Under 2 years	Over 2 years	Adults	Salk	Others	
West Australia	221	498	179	365	122	1,385
South Australia	150	270	122	499	62	1,003
Total	371	768	301	864	184	2,388

Seventy-three Expectant Mothers were given advice, this number being included in 301 Adults seen.

This service continued to do good work and is much appreciated by the isolated population along the line.

STAFF

Number of Sisters (full time)	69
Number of Sisters (part time)	2
Part time Reliever	1

Sister G. Turton and Sister A. Bailey died during the year. Their deaths were a great loss to the Infant Health Service as they had both done valuable work for many years.

Sister Royce was married and resigned, after many years of splendid service both in the country and in the city.

Long Service Leave was granted to Sisters F. Smith and B. Wells. Sister C. Hall retired in June after many useful years in the Infant Health Service.

The Annual Refresher Course was held from 29th July to 2nd August and was most successful.

Storage rooms under the Infant Health Headquarters at 1120 Hay Street, West Perth, were converted into a suite of three offices for the Medical Supervisor of Infant Health and other staff. The Medical Supervisor and all Headquarters Staff of the Infant Health and Pre-School Service are now housed under one roof.

In conclusion I wish to record my appreciation to the Infant Health and Pre-School Staff for their loyalty and their conscientious work without which the results recorded in this report could not have been achieved.

ELIZABETH M. GIBSON,
Medical Supervisor of Infant Health.

ANNUAL SUMMARY, JANUARY – DECEMBER, 1957

Centres.	Gross Number of Attendances.					Individual Babies Attended.					Birth Notifications Received. (11)	New Babies. (12)	Transfers from other Centres. (13)	Visiting Babies. (14)	Individual Expectant Mothers. (15)
	Under 12 months. (1)	1–2 years. (2)	Total 1 + 2. (3)	Over 2 years. (4)	Grand Total 3 + 4. (5)	Under 12 months. (6)	1–2 years. (7)	Total 6 + 7. (8)	Over 2 years. (9)	Grand Total 8 + 9. (10)					
Albany	2,705	191	2,896	91	2,987	249	60	309	47	356	279	207	24	50	7
Applecross	4,298	426	4,724	219	4,943	381	164	545	104	649	190	214	22	125	5
Armadale, Caravan No. 4	3,458	367	3,825	311	4,136	290	109	399	39	438	192	169	7	52	29
Bayswater	3,689	118	3,807	17	3,824	396	33	429	....	429	207	162	19	23	....
Beverley	2,077	172	2,249	111	2,360	259	92	351	54	405	236	195	11	9	36
Boulder	2,638	177	2,815	71	2,886	227	60	287	21	308	263	86	3	22	16
Bridgetown	2,980	289	3,269	98	3,367	289	116	405	68	473	244	214	11	16	2
Bruce Rock	2,683	145	2,828	24	2,852	339	35	374	12	386	220	217	18	17	10
Bunbury	4,554	181	4,735	30	4,765	438	80	518	24	542	317	275	24	45	1
Busselton	3,785	369	4,154	71	4,225	369	80	443	32	475	272	231	14	....	....
Cannington	1,815	52	1,867	75	1,942	375	49	424	68	492	....	178	9	....	....
Carnarvon	386	150	536	86	618	80	23	103	32	135	86	77	11	11	7
Claremont	3,599	243	3,842	86	3,928	185	98	283	7	290	227	205	....	56	17
Collie	2,274	186	2,460	183	2,703	300	50	350	20	370	263	184	12	12	24
Corrigin	1,592	342	1,934	556	2,490	172	68	240	221	461	101	156	43	32	41
Cottesloe	4,008	167	4,175	160	4,335	217	147	364	24	388	229	213	24	104	....
Doubleview, No. 1	4,766	200	4,966	26	4,992	213	130	343	13	356	268	271	35	24	....
Doubleview, No. 2	1,094	44	1,138	....	1,138	129	37	166	....	166	89	71	6	13	2
East Fremantle....	3,562	280	3,842	227	4,069	464	68	532	84	616	304	226	23	35	38
Esperance	476	42	518	17	535	37	9	46	1	47	38	32	11	30	11
Fremantle	3,905	265	4,170	141	4,311	430	98	528	60	588	296	273	21	74	....
Fremantle, Caravan No. 1	3,683	947	4,630	642	5,272	230	204	434	56	490	262	229	19	68	27
Geraldton	3,787	105	3,892	46	3,938	422	60	482	42	524	317	309	16	98	4
Gosnells	4,323	308	4,631	131	4,762	274	74	348	100	448	302	266	21	46	....
Guildford	3,243	125	3,368	5	3,373	361	66	427	5	432	242	207	24	39	....
Hackett Estate	3,717	167	3,884	40	3,924	305	61	366	31	397	247	225	35	19	11
Harvey	2,542	117	2,659	168	2,827	265	51	316	39	355	262	218	....	41	12
Hilton Park	3,541	56	3,597	15	3,612	392	31	423	....	423	283	210	25	16	19
Inglewood	4,935	194	5,129	22	5,151	397	88	485	19	504	259	278	33	65	23
Kalamunda	3,899	154	4,053	36	4,089	426	53	479	5	484	290	260	49	42	5
Kalgoorlie	5,013	317	5,330	203	5,533	349	232	581	106	687	421	332	16	105	4
Katanning	1,906	210	2,116	92	2,208	299	48	347	23	370	194	177	8	29	9
Kellerberrin	2,000	201	2,201	70	2,271	255	94	349	33	382	141	131	26	40	6
Kensington	5,059	144	5,203	159	5,362	586	23	609	25	634	414	343	23	95	4
Leederville	4,340	105	4,445	34	4,479	377	50	427	6	433	288	257	33	32	....
Manjimup	3,678	306	3,984	221	4,205	315	49	364	69	433	277	294	5	24	79
Maylands	4,564	164	4,728	20	4,748	456	77	533	20	533	279	310	53	39	....
Melville	3,500	429	3,929	349	4,278	236	109	345	167	512	221	202	22	17	....
Midland Junction	4,245	278	4,523	58	4,581	350	87	437	34	471	284	284	33	134	2
Midland Junction, Caravan No. 2	1,422	197	1,619	37	1,656	96	85	181	25	206	107	77	20	12	....
Mingenew	3,632	551	4,183	283	4,466	223	181	404	200	604	237	247	23	34	27
Moora	3,067	508	3,575	336	3,911	371	95	466	51	517	197	220	18	119	24
Mt. Barker	731	129	860	154	1,014	222	47	269	75	344	158	119	6	23	19
Mundaring, Caravan No. 3	3,596	256	3,852	102	3,954	259	105	364	49	413	153	143	10	35	16
Narrogin	2,347	231	2,578	125	2,703	319	100	419	78	497	340	226	18	27	3
Nedlands	3,645	209	3,854	117	3,971	285	99	384	39	423	190	182	20	81	1
Northam	2,684	237	2,921	154	3,075	285	79	364	63	427	250	227	17	35	25
North Perth	4,935	222	5,157	28	5,185	509	92	601	18	619	318	319	33	61	1
Osborne Park	3,505	139	3,644	4	3,648	385	78	463	4	467	442	274	29	55	....
Perth	4,000	259	4,259	157	4,416	459	71	530	31	561	410	349	72	207	115
Pinjarra	1,989	109	2,098	8	2,106	168	37	205	2	207	190	118	15	77	....
Rivervale	4,213	121	4,334	95	4,429	251	32	283	58	341	413	285	21	12	7
Rockingham	2,582	147	2,729	22	2,751	233	65	298	6	304	164	153	19	41	4
Scarborough	3,688	152	3,840	....	3,840	315	41	356	....	356	179	213	46	29	4
South Perth	4,510	306	4,816	23	4,839	417	41	458	18	479	372	280	46	42	....
Subiaco	3,482	300	3,782	391	4,173	307	172	479	227	706	267	242	42	58	5
Victoria Park	4,937	211	5,148	....	5,148	554	75	629	....	629	238	336	60	208	3
Wagin	2,843	213	3,056	112	3,168	311	88	399	44	443	266	215	7	20	11
Wembley	3,822	178	4,000	73	4,073	278	69	347	11	358	218	206	23	44	21
West Perth	958	57	1,015	38	1,053	117	30	147	31	178	43	58	8	19	2
Wyalkatchem	2,165	147	2,312	30	2,342	447	52	499	30	529	258	191	7	16	32
Total	197,172	13,612	210,784	6,944	217,728	18,945	4,797	23,742	2,771	26,513	14,712	12,538	1,371	3,029	656

ANNUAL SUMMARY, JANUARY – DECEMBER, 1957–continued

Centres.	Medical Visits.												Advice by Letter.	Advice by Telephone.	Mothers Referred Correspondence Sister.	Lectures given.	Group Demonstrations.	Deaths.
	Doctor.		Hospital.		Total.		Hospital (Number of Babies).	Home.										
	Baby Referred. (16)	Mother Referred. (17)	Baby Referred. (18)	Mother Referred. (19)	Babies Referred 16 + 18. (20)	Mothers Referred 17 + 19. (21)	(22)	To Babies, First. (23)	To Babies. Subsequent. (24)	Expectant Mothers. (25)	Ineffective. (26)	Total 23 — 26. (27)	(28)	(29)	(30)	(31)	(32)	(33)
Albany	74	7	1	....	75	7	376	115	182	....	10	307	3	217	5	6	6	....
Applecross	35	8	....	....	35	8	....	314	255	....	....	569	....	418	....	....	....	....
Armadale, Caravan No. 4	64	12	3	....	67	12	198	....	....	....	....	....	14	....	3	....	....	....
Bayswater	15	2	....	....	15	2	....	151	46	....	9	206	49	19	....	....	....	....
Beverley	40	10	....	....	40	10	215	48	65	17	13	143	....	97	52	26	16	....
Boulder	75	3	....	....	75	3	175	157	53	5	45	260	....	36	36	16	1	....
Bridgetown	26	4	....	....	26	4	213	22	382	....	1	405	1	119	....	8	....	....
Bruce Rock	47	4	....	....	47	4	376	61	41	5	10	117	....	17	7	9	3	....
Bunbury	28	4	....	....	28	4	429	206	29	....	26	261	....	70	1	1	1	....
Busselton	25	....	....	....	25	....	29	61	745	....	60	866	....	22	....	....	....	....
Cannington	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Carnarvon	2	....	....	....	2	....	25	42	25	9	2	78	19	10	20	11	6	....
Claremont....	23	1	3	....	26	1	....	206	362	....	1	569	28	121	....	....	6	....
Collie	47	19	17	13	64	32	336	282	381	28	10	701	5	109	9	10	....	....
Corrigin	73	18	2	....	75	18	122	60	71	3	....	134	....	30	11	1	....	....
Cottesloe	56	6	2	....	58	6	31	242	109	....	3	354	....	....	126	....	....	....
Doubleview, No. 1	89	13	....	2	89	15	....	242	246	....	12	500	....	290	....	....	....	....
Doubleview, No. 2	26	2	....	1	26	3	....	101	107	....	....	208	....	84	....	....	....	....
East Fremantle	55	1	....	....	55	1	295	262	459	....	....	721	....	21	....	....	....	....
Esperance	3	9	....	....	3	9	31	....	10	....	1	11	....	....	2	....	....	....
Fremantle....	74	9	....	....	74	9	787	286	574	....	29	889	4	318	....	....	233	....
Fremantle, Caravan No. 1	140	4	....	....	140	4	....	187	42	2	46	277	41	1	2	....	747	....
Geraldton	58	10	....	....	58	10	382	73	52	2	....	127	1	77	12	41	....	....
Gosnells	....	....	....	....	....	....	....	141	285	....	38	464	....	7	....	....	....	....
Guildford	52	3	....	....	52	3	....	221	231	1	4	457	11	....	1	....	....	....
Hackett Estate	51	7	....	....	51	7	....	261	397	2	57	717	....	66	....	....	....	....
Harvey	50	23	....	....	50	23	765	66	87	7	....	160	1	....	4	7	....	....
Hilton Park	97	5	....	....	97	5	....	257	492	5	3	757	....	61	....	....	....	....
Inglewood....	84	23	....	....	84	23	....	274	22	....	5	301	....	82	....	....	....	....
Kalamunda	32	13	....	....	32	13	....	115	410	4	79	608	2	96	....	....	1	....
Kalgoorlie....	85	25	....	....	85	25	448	282	4	....	2	288	....	292	2	15	6	....
Katanning	8	....	....	....	8	....	175	19	20	....	4	43	....	32	....	...	....	....
Kellerberrin	15	3	....	....	15	3	138	44	149	....	5	198	....	55	....	....	....	....
Kensington	49	2	....	....	49	2	....	361	52	....	54	467	100	109	2	....	....	....
Leederville	31	5	....	....	31	5	80	305	332	6	5	648	....	....	....	....	....	....
Manjimup	148	5	....	....	148	5	261	59	....	....	....	59	2	182	2	8	1	....
Maylands	42	1	1	....	43	1	1,201	241	154	....	90	485	....	52	....	....	....	....
Melville	26	17	....	....	26	17	....	207	339	....	....	546	....	139	....	....	....	....
Midland Junction	52	5	....	....	52	5	508	170	102	....	30	302	....	97	5	1	....	....
Midland Jct., Caravan No. 2	19	5	....	....	19	5	80	41	33	....	6	80	....	....	2	....	....	....
Mingenew	72	24	5	1	77	25	228	21	53	1	3	78	22	134	....	....	....	....
Moora	15	....	....	....	15	....	174	....	42	....	....	42	2	5	9	....	....	....
Mt. Barker	33	6	2	....	35	6	137	38	64	13	2	117	6	13	2	26	12	....
Mundaring, Caravan No. 3	54	12	....	....	54	12	....	135	1,367	....	15	1,517	2	17	....	....	....	....
Narrogin	26	9	2	....	28	9	261	54	25	....	7	86	2	47	7	29	2	....
Nedlands	16	2	....	....	16	2	....	176	185	....	15	376	....	149	....	....	....	....
Northam	27	8	....	....	27	8	384	165	90	1	30	286	1	85	....	18	2	....
North Perth	91	13	....	....	91	13	....	257	58	2	32	349	....	75	....	....	....	....
Osborne Park	....	1	....	....	....	1	1	290	616	....	75	981	....	3	....	....	....	....
Perth	107	33	1	10	108	43	....	418	315	9	72	814	....	582	....	....	....	....
Pinjarra	11	3	....	....	11	3	99	100	11	....	....	111	1	....	1	....	....	....
Rivervale	31	....	....	....	31	....	....	426	16	....	....	442	....	....	....	....	....	....
Rockingham	14	....	3	....	17	....	159	182	117	5	11	315	....	33	2	21	19	....
Scarborough	53	2	....	....	53	2	....	220	257	1	10	488	5	114	....	....	....	....
South Perth	58	5	....	....	58	5	....	355	133	....	49	537	....	161	....	....	....	....
Subiaco	81	3	59	....	140	3	....	260	362	5	1	628	....	301	....	....	....	....
Victoria Park	15	1	....	....	15	1	....	384	71	....	1	456	....	210	....	....	....	....
Wagin	62	2	....	....	62	2	154	33	268	17	34	352	4	49	1	27	2	....
Wembley	17	2	....	....	17	2	....	231	78	....	2	311	....	90	....	....	....	....
West Perth	10	....	....	....	10	....	....	23	13	1	13	50	....	240	1	....	....	....
Wyalkatchem	14	3	....	....	14	3	111	81	51	3	9	144	2	10	....	....	....	....
Total	2,723	417	101	28	2,824	445	9,384	10,030	11,537	154	1,041	22,672	328	5,674	325	281	1,064	

Appendix XV

SCHOOL MEDICAL SERVICE

The School Medical Service is now working on the Regional Scheme under three Regional School Medical Officers. Only one of the Regions has been able so far to obtain a School Medical Officer to assist the Regional School Medical Officer.

The Metropolitan area is now being worked on the three examinations for every child during the child's school life. In country areas the School Medical Service is trying to provide a medical examination every two years. This objective, because of the shortage of staff, has not yet been achieved, but as the figures in Table I show a much bigger proportion of country children to Metropolitan children was examined this year than last year.

A total of 35,093 children were examined of which 13,938 were in the country. The parents of 14,372 were notified of some defect or other including dental defects. Four thousand five hundred and eight were referred for medical attention. The follow up of the Home Visiting Nurse—Table II—indicates a good response by the parents in obtaining medical attention.

The follow-up Home Visit has given such encouraging results in the Metropolitan area that it has been considered worth while sending a nurse to larger country towns to do a follow-up visit. This has already been done in Albany and Geraldton.

A total of 74,235 children were examined for pediculosis (Table III) and the number notified as infected was 264. The majority of these was in the country and arose in native children. Many revisits by the nurse are necessary to ensure that effective treatment has been given and consequently including re-examinations, a total of 113,485 heads was examined.

During the year 184 parents were interviewed by the School Medical Officers.

The general health and nutrition of the children remain good and Table I is comparable in all respects with similar tables in previous years.

The general state of sanitation and hygiene of schools is good, but there is room for improvement in the installation of septic systems in a number of rural schools and the provision of flywire to fly-proof schools in market garden and bush areas.

Medical inspections rooms are still deficient or absent even in newly constructed schools although some improvements in this direction have been attempted in certain places.

Some difficulties are still encountered with the child's medical history card and its forwarding from school to school as the child migrates. It has been suggested that a lecture by a School Medical Officer to school teachers while under training might be beneficial to smoother working of the School Medical Service and increase the co-operation between school doctor and teaching staff.

Table I

EXAMINATION OF METROPOLITAN AND COUNTRY SCHOOL CHILDREN, 1957

——	Number Examined	Number Notified	Number Referred for Medical Attention	Number Referred for Home Attention and Observation	Number Requiring Dental Attention	Skin Complaints.		Nutrition.			Eyes Medical Attention	Tonsils Medical Attention
						Number	Per cent.	3	Under 3	Over 3		
						Metropolitan Schools						
Boys	10,926	4,442	1,296	1,267	2,660	....	....	9,976	285	665	....	....
Girls	10,229	3,687	1,314	1,195	2,456	....	....	8,902	421	906	....	....
Total	21,155	8,129	2,610	2,462	5,116	1,507	7·12	18,878	706	1,571	1,169	390
						Country Schools						
Boys	7,182	3,245	1,064	941	1,765	....	....	6,661	148	373	....	....
Girls	6,756	2,998	834	1,041	1,679	....	....	5,914	165	677	....	....
Total	13,938	6,243	1,898	1,982	3,444	1,159	8·32	12,575	313	1,050	1,002	266
						State Total						
Boys	18,108	7,687	2,360	2,208	4,425	....	....	16,637	433	1,038	....	....
Girls	16,985	6,685	2,148	2,236	4,135	....	....	14,816	586	1,583	....	....
Total	35,093	14,372	4,508	4,444	8,560	2,660	7·58	31,453	1,019	2,621	2,171	656

Table II

HOME VISITING BY SCHOOL NURSES, 1957

Metropolitan Area

Total Visits *re* Medical Attention	Received Attention	Promised Attention	Disinterested	Out or Left District	Visits to Cases Referred for Home Attention	Parents Phoned or Called Office
3,469	1,835	985	64	727	100	273

Country Areas—1,046 visits made.

Table III

Hygiene Inspection by Nurses for Pediculosis

	No. of Children Examined	Number Notified	Percentage
Metropolitan	58,454	55	·09
Country	15,781	209	1·32
Total	74,235	264	·35

Including revisits to above a total number of 113,485 heads were examined or re-examined. A large proportion of children notified in the country were coloured.

Appendix XVI

REPORT OF CONSULTANT OPHTHALMOLOGIST

Professor Ida Mann

The work for the year 1957 falls under three main headings as before.

1. PARTIALLY SIGHTED AND BLIND CHILDREN

Twelve children were examined in conjunction with the Department of Education for possible admission to the partially sighted class. Seven of these were short term assignments for squints having treatment by occlusion. All these children will probably be returnable to the normal school quite soon. Three children are high myopes, two of them amblyopia. They will probably remain longer in the partially sighted class but may, in the end, improve sufficiently for the normal school. One child with buphthalmos is being tried out at the partially sighted class, but will probably become blind later on. One child with an alternating squint was not considered suitable and was returned to the normal school.

The children already in the partially sighted class are continuing to show improvement, both in point of view of sight and education. They are being maintained at a scholastic level normal for their age.

2. TRACHOMA

The campaign for the eradication of trachoma from schools and missions has continued and is now beginning to show good results, the incidence in some schools being reduced to 5 per cent. or less, whereas previously it was well over 50 per cent. If this campaign can be continued for a few years longer we will have done much to ensure that the future generation will not be at all seriously affected.

A visit was made to Groote Eyelandt and Arnhemland in conjunction with the Commonwealth Health Department to investigate the bacteriology of the secondary infections in trachoma. Some interesting results were obtained and it is hoped that a paper will be published shortly.

The trachoma patrol routes are being slowly worked over by the travelling nurses and trachoma officers, and by the end of 1958 it seems likely that every place in the State will have been visited, surveyed and probably treated at least once.

3. OTHER EYE DISEASES

Advice has been given to the State Medical Officers on many points connected with diagnosis and treatment of eye conditions. Many patients have been brought to Perth for treatment.

A campaign against purulent ophthalmia has been started as this disease has an adverse effect on the trachoma incidence.

No further cases of A.P.C. virus disease have been notified and this does not seem to be a problem.

Several cases of spring catarrh have been diagnosed and dealt with.

IDA MANN,
Consultant Ophthalmologist.

Appendix XVII

Commissioner of Public Health.

Following is my report on the School Dental Service for the year 1957 :—

STAFF

For the first time since the establishment was raised to 14 some years ago, we commenced the year with a full staff and although there were a couple of resignations we were able to replace them and so complete the year with the full number.

Four dentists are now based on country towns, while five others, although based on Perth, spend all their time in country areas ; the other four field dentists alternate their time between the country and the Metropolitan area.

The most important innovation for the year was the building of a combined residence and dental surgery block in Carnarvon and the man we have stationed there spends part of his time travelling through the lower North-West and Murchison towns.

The Kimberley district (from Broome to Wyndham) was visited again by a dentist supplied by the Victorian Section of the Flying Doctor Service ; this tour was subsidized by the Public Health Department.

A Perth private dentist also worked in Broome for several weeks. Having prior knowledge of this, I discussed the matter with him and eventually arranged to lend him several heavy items of equipment ; in return he treated all children brought to him free of charge. The equipment is to remain in Broome for the use, under similar conditions, of any other private dentist who may wish to go there.

SCHOOL VACATIONS

Contrary to the opinion held by a number of people, our dental officers do not have the Education Department school holidays. Our men take their annual leave of two weeks when the schools close for the Xmas vacation, but for all other periods when the schools are closed, they work in orphanages, Native Missions and similar institutions.

Figures concerning our Service for 1957 are :—

Number of country schools visited	152
Number of metropolitan schools visited	16
*Number of native missions visited	9
*Number of orphanages visited	11

* Means both country and metropolitan.

Number of children examined	12,364
Number of children treated	7,311
Number of children needing no treatment	3,590
Number of children who were to receive treatment by private dentists	515
Number of children whose parents did not bother to reply to notices sent out	948

Dental operations performed :

Silver amalgam fillings	8,048
Copper amalgam fillings	2,129
Cement fillings	1,225
Porcelain fillings	819
Silver nitrate treatments	1,691
Other conservative treatments	6,314
Extractions	14,098
Prophylaxis	1,075
Talks, personal interviews, etc.	312
Gold inlays	2
Dentures	19
Orthodontic treatment	22
Pulp treatments	109
X-ray films taken	30

It will be seen that quite a number of dentures were made for children, young as they are while attending school. They are mainly the 12, 13 and 14 age groups at the small schools in isolated districts.

The number of orthodontic treatments was also considerably more than in previous years and was mainly for the younger children. These jobs, involving the straightening of crooked teeth, were mostly simple cases not involving many visits, but the results can be spectacular and are greatly appreciated by the parents.

Most of the laboratory work necessary for the construction of dentures and orthodontic appliances was done by Perth Dental Hospital technicians and I would like to express my appreciation of the willing co-operation of the Superintendent and his staff.

A number of the School Dental Officers carry 16 mm. films, some of which are suitable for adults and some for children ; when the opportunity occurs they are shown to the children during school hours and to adults at Parents and Citizens' Association Meetings.

RESEARCH

In an endeavour to trace some common factor in the diet or personal history of children who have been found during the course of routine examinations to have good teeth, we have, during the last few years sent questionnaires to the parents of the children concerned. When I state that only 5 per cent. or less are found to have perfect mouths, it will be realized that it takes a long while to gather a few replies. However, information so far obtained appears below. Not every question was answered in all cases. The number of children involved is 714.

1. Q. Does the child eat many biscuits, lollies, cakes ?
   A. Yes, 174. No, 505.

2. Q. Does he eat much fruit and green salads ?
   A. Yes, 639. No, 60.

3. Q. Does he drink much milk ?
   A. Yes, 553. No, 156.

4. Q. Does he clean his teeth regularly ?
   A. Yes, 456. No, 253.

5. Q. Was he taken regularly to an Infant Health Clinic (this question was asked in only 180 cases)?
   A. Yes, 128. No, 52.

6. Q. Have your other children good teeth ?
   A. Yes, 534. No, 57. Fairly good, 16.

7. Q. Do good teeth run in the father's or mother's families (i.e. are they hereditary) ?

A.	
(a) Good teeth on both parent's sides	355
(b) Good one side, bad the other	142
(c) Fair both sides	32
(d) Bad on both sides	67

8. Q. Country of birth of parents.

A.	
(a) Both born in Australia	440
(b) One in Australia, one Great Britain	132
(c) One in Australia, one Continent	25
(d) Both in Great Britain	55
(e) Both from the Continent	50
(f) One Great Britain, one Continent	6

9. The children were born as follows :—

Australia	628
Britain	39
Continent	29
India	6

10. Question asked was " Is there any other information which you think might help us ? "

There were many interesting replies to this, mainly in regard to pre-natal diet and the types of food to which the children were particularly partial. A summary is as follows :—

56 mothers stated that they took calcium and vitamins in concentrated quantities pre-natally.

3 had lots of milk pre-natally.

3 had large quantities of orange juice pre-natally.

15 mothers considered that breast-feeding their babies for 10 or 11 months helped tooth formation.

In regard to the children's diet the following articles of food were mentioned as having been consumed in large quantities :—

Milk, 42 ; Concentrated calcium, 20 ; Lime-water, 7 ; Vitamins, 8 ; Codliver Oil, 16 ; Fruit, 43 ; Apples (specifically mentioned), 29 ; Carrots, 5 ; Wholemeal bread, 14 ; Green salads and raw vegetables, 35 ; Dairy products, 84.

Other hints were as follows :—

(a) Finishes each meal with apple or carrot	9
(b) Fond of chewing bones	1
(c) Cleaning teeth with salt water	3
(d) Drinks a lot of orange juice	6
(e) Dislikes anything sweet	7
(f) Vegetarians	2
(g) Rinsing with water after meals	2
(h) Cleans teeth with milk of magnesia.	1
(i) Cleans teeth with medicated tooth picks	1
(j) Drank a lot of milk but also ate a lot of sweets	1
(k) No sweets plus regular cleaning after meals.	12

In contrast with this last hint, 75 children never cleaned their teeth and were allowed as many cakes, lollies, etc. as they pleased.

There were six cases of siblings eating the same foods, etc., yet showing a difference in tooth quality as under :—

(a) 3 children—1 had good teeth, 2 bad.
(b) 8 children—6 had good teeth, 2 bad.
(c) 3 children—2 had good teeth, 1 bad.
(d) 2 children—1 had good teeth, 1 bad.
(e) 6 children—4 had good teeth, 2 bad.
(f) 2 children—1 had good teeth, 1 bad.

With every question asked, there is generally a big majority on the orthodox credit side ; however, there are also always some on the debit side.

A. G. McKENNA,
Senior Dental Officer.

Appendix XVIII

REPORT BY THE CHIEF INSPECTOR (General)

The Commissioner of Public Health.

Submitted herewith is a summary of the work of the Inspection Branch during 1957.

ENVIRONMENTAL SANITATION

During the year, 284 proposed new land sub-divisions were examined to determine their suitability as housing sites. The size of these sub-divisions varied from one-half acre lots to large area surveys containing hundreds of acres.

Sub-soil water levels play a large part in assessing the suitability of these sites. Information regarding these levels is, for the most part, supplied by the Metropolitan Water Supply, Sewerage and Drainage Department, and this Department is grateful for their co-operation.

Fifty-two sanitary surveys were made of country townships ; 144 public buildings and 39 hospitals were also inspected.

Fourteen appeals against decisions of local health authorities were investigated on behalf of the Commissioner of Public Health.

Altogether, 629 general inspections were carried out during the year.

The check sampling of swimming places was continued. Five hundred and sixty-six samples were submitted for bacteriological or chemical examination.

The work begun in 1956 on the control of fly breeding in manure and compost was concluded this year after much painstaking work by the Pest Control Officer, Mr. J. Fowler.

The Department was able to establish that diazinon and malathion were efficient fly larvicides and that they could be used at concentrations which provided efficient fly control at low cost.

Approximately 200 visits were made by pest control officers to hospitals and departmental institutions for the control of vermin and insect pests.

PESTICIDE REGISTRATION

The number of pesticides registered by the end of the year was 625.

FOOD AND DRUGS

The work of the meat inspection staff is shown in Appendix XXVII. As can be expected, the work of this branch continues to increase in proportion to increases in State population.

General inspections carried out at the Fremantle Wharf included the examination of approximately 2¼ million pounds of fish and 3 million pounds of meat.

One hundred and twenty samples of food were submitted for chemical analysis and bacteriological examination.

A general survey of the metropolitan area was made to ensure that only permitted colours were being used in the preparation of food. Colours not included in the list of permitted dyestuffs were withdrawn from sale.

The rapid development of new trends in the food industry indicates that it will be necessary in the near future to provide specialist food inspectors who will be employed full time on similar surveys.

HEALTH INSPECTORS' CONFERENCE

The Annual Health Inspectors' Conference was held at St. John Ambulance Headquarters, Perth, on 26th and 27th September. It was well attended by inspectors from metropolitan and country districts.

The conference was opened by the Minister for Health, the Hon. E. Nulsen, who welcomed the delegates.

The following addresses were given :—

Review of Current Problems (Dr. Linley Henzell, Commissioner of Public Health).
The Aims and Objects of Health Education (Mr. J. T. Carr, Executive Officer, Health Education Council).
Public Relations (Mr. F. A. Bird, Public Relations Officer, Shell Co. of Australia).
Fly Control—Some Tests with Modern Insecticides (Mr. C. E. Flower, Chief Inspector, Public Health Department).
The Bacteriological Examination of Water (Mr. E. F. Browning, Public Health Laboratories).

Delegates were shown a film dealing with the manufacture of building board made from straw and were taken on a conducted tour of a factory where this material was being made.

C. E. FLOWER,
Chief Inspector (General).

Appendix XIX

Commissioner of Public Health.

NURSING SECTION

Hospital Staffing

There is little change to report in the nursing position. This year the North-West Hospitals have been better staffed, as are those situated in the South-West area, but there is still difficulty in keeping staff establishment up to standard in the not so popular areas. The staff turn-over remains high.

Nursing Bursaries

Forty-nine Nursing Bursaries were awarded and although awards do not reach a high figure. the bursary system does much towards publicising nursing and disseminating information regarding the necessity for the prospective nurse to reach a high educational standard. Many interviews take place with interested students and parents.

There are now 30 bursary students in training and within two years this group will be available as Staff Nurses to either Metropolitan or Country Hospitals, it being a condition of the Bursary that the student serves 12 months as a Staff Nurse, six months of which may be taken in the student's own Training School and six months in a Country Hospital. Unfortunately, a very small percentage entering training under this scheme choose the Government School of Nursing.

SCHOLARSHIPS AWARDED FOR POST-GRADUATE STUDY

Two scholarships valued at £600 were awarded to students for the Diploma Course in Nursing Administration at the College of Nursing, Australia.

SPECIAL NURSING RECRUITMENT SCHEME

This scheme was put into effect to bring selected Nurses from the United Kingdom to Australia, where they would nurse as required in Government Hospitals for two years. One D.C. Sister and two S.C. Sisters arrived in April, 1957, bringing the total to 10. One of those arriving in 1956 has returned to England.

INSPECTIONS

Visits to Country Hospitals.—Due to shortage of personnel in the Nursing Branch, these visits were kept to a minimum, only 11 hospitals being visited during the year.

Private Hospitals and Maternity Homes.—Routine inspections of Private Hospitals and Maternity Homes carried out.

NEW REGISTRATIONS " C " CLASS HOSPITALS

	No. of Beds
Yeovil, 5 Melville Street, Claremont	11
Montrose, 12 Grange Street, Claremont	9
Morna, 14 Alban St., Mount Lawley	14
Kalmar, Stoneville Road, Mundaring	4
Braille Society for the Blind	60
Hampton, 6 Hampton Road, Victoria Park	16
Annesley, 49 Lawley Crescent, Mount Lawley	26
Hammersley, 441 Rokeby Road, Subiaco	11
Martindale, 105 Tweedale Road, Applecross	11
Lyndale, 20 Gugeri Street, Claremont	7

NURSE TRAINING

Publicity and Recruitment.—The Organiser of Nurse Training carries out the only recruitment programme in the State. She does this by visiting schools from Geraldton to Kalgoorlie and Albany, and is responsible for directing the interest of many school girls to nursing, resulting in their entry to Metropolitan Hospitals rather than to Government Hospitals. During 1957, 67 schools were visited and publicity given by means of films, talks, interviews and distribution of pamphlets. Many enquiries have been attended to with reference to all aspects of Nurse Training.

Government School of Nursing.—The School situated in 18 Colin Street, West Perth, is proving very successful in that the Students' Residence and Teaching Department provide an environment very much appreciated by Student Nurses and is a setting for a school in the true meaning of the term. The school lacks sufficient qualified staff and the five country Training Hospitals are similarly deprived. However, good teaching is given by experienced Sisters.

Tuberculosis Nurses and Midwives in Training.—This year has seen the beginning of affiliated training between the Government School of Nursing and the Wooroloo Sanatorium, and the Government School of Nursing and King Edward Memorial Hospital, in that the nurses undertaking the two-year Tuberculosis Course and nurses taking the two-year Midwifery Course have been included in the Schools Preliminary Training Class.

Repatriation General Hospital.—The School is indebted to Repatriation General Hospital for allowing Block Students to visit the Hospital for instrument lectures and observation of theatre technique.

In 1957 it was arranged that Student Nurses from the Geraldton and Northam Hospitals should spend a fortnight in Operating Theatre training in their final year. This experience of specialist surgery has been most instructive to the nurses concerned.

This year also saw a new departure in General Training in that for the first time a Male Nurse entered an affiliated Course by receiving theoretical instruction at the Government School of Nursing and general instruction at the Repatriation General Hospital.

VISITS TO HOSPITALS

Kalgoorlie	2
Northam	3
Geraldton	2
Collie	3
Narrogin	2
Merredin	2
Busselton	2
Katanning	2
Albany	2
Mount Henry	2

NURSES IN TRAINING

General Training	145
Commenced Training in 1957	67
Passed Final Nurses' Registration Board Examination (1 Credit)	34

TERMINATION

Transferred to Nursing Aide Course	6
Resignations	22
Terminations	5

NURSING AIDES

In Training	104
Completed the Course	49

Albany District Hospital.—Commenced training Nursing Aides in November, 1957, and has accommodation for 19 Nursing Aides at present.

PHYLLIS F. LEE,
Principal Matron.

Appendix XX

NURSES REGISTRATION BOARD

Eleven meetings were held at the Department of Public Health.

The number of nurses in the various divisions of the register, and nursing aides on the roll, whos registrations or enrolments were in force at 31st January (the date on which the register and roll were taken out for publication) was :—

General	2,815
Midwifery	2,412
Infant Health....	221
Mental	76
Tuberculosis	73
Mothercraft	52
Nursing Aides	206
Dental	17

Fourteen examinations for registration were conducted as follows :—

General Nurses	3
Midwifery Nurses	3
Mental	3
Tuberculosis	1
Mothercraft	3
Dental	1

Three examinations for enrolment were conducted for nursing aides.

Three First Year Professional examinations in the subjects of Anatomy and Physiology, Personal and Communal Health, and Junior General Nursing, were held for general nurses.

On 26th June, the Board resolved to grant registered auxiliary nurses of Tasmania, State-enrolment as nursing aides.

M. TULLY,
Secretary.

Appendix XXI

ANNUAL REPORT OF THE PUBLIC HEALTH PHOTOGRAPHIC DEPARTMENT

To the Commissioner of Public Health.

I have the honour to report on activities for the year ended 31st December, 1957.

In April the photographic department was required to vacate its accommodation in the Royal Perth Hospital, and temporary quarters were found in Fremantle Hospital.

In June a Junior Assistant Photographer was appointed to replace the previous assistant who resigned in January.

Apart from the Public Health Department and the Public Health Laboratories photographic services were also given to the following :—

Princess Margaret Hospital for Children.
King Edward Memorial Hospital for Women.
Fremantle Hospital.

In addition, a small amount of work was done for the Royal Perth Hospital and for consultants in private practice.

Work undertaken for these institutions included clinical photography of patients, specialised photography of the eye, photography through the microscope, pathological and bacteriological specimens, and postmortem dissections, and other photography of a general nature.

During the year a total of 591 requests was received for photographic services as shown in the following table.

Originator	Total Requests	Patients	Miscellaneous	Transparencies	Enlargements
Public Health Department	172	18	154	1,383	793
Fremantle Hospital	22	11	11	150	6
Princess Margaret Hospital	241	198	43	785	117
Royal Perth Hospital	102	16	86	426	78
King Edward Memorial Hospital	9	3	6	20	53
Red Cross	6	....	6	25	16
Private Cases	39	31	8	238	7
Total	591	277	314	3,027	1,070

Two exhibitions were held in support of the appeal for funds in aid of the Linear Accelerator, and one exhibition in connection with nursing recruitment.

Photographic work and papers written on medical photographic techniques were sent to the Royal Photographic Society of Great Britain, and the Associateship (Medical) of that Society was awarded to the Senior Technician (Photography).

RONALD PLUMMER, F.R.P.S.,
Senior Medical Photographer.

Appendix XXII

REPORT FROM THE EXECUTIVE OFFICER
HEALTH EDUCATION COUNCIL OF WESTERN AUSTRALIA

To the Commissioner of Public Health.

Health education is concerned with the whole range of research planning and methods for increasing he ability of people to make wise choices in matters of health. It therefore endeavours to develop sound attitudes towards health and its protection among individuals and groups. It usually starts with helping people to become aware of a problem or to deal with some health hazard they recognise. It then proceeds to interest them in taking part in solving this problem, working out with them the scientific basis for its solution and finally equipping them, as far as is possible, with the ability to deal with it themselves. It implies mutual confidence between health workers and laymen.

In view of the decision made at the first Council meeting to concentrate on the home accidents problem, particularly as it affects children, much of the Council's efforts during the past year have been applied to finding effective methods of helping individuals and groups reduce home accidents. A sustained Press and radio campaign was conducted with the aim of drawing public attention to the problem; and this resulted in the Corrigin community being stimulated to make a concentrated effort to reduce accidents in that district. This project was successful. Seven more districts have followed Corrigin's example.

Of two projects conducted in the metropolitan area, one was a failure and the other was successful within its limited aims. No local health education committees were formed as a result of these two experiences. It seems clear that until efficient methods of influencing metropolitan communities are evolved, reliance will have to be placed on mass communications media. These are of doubtful value in changing individual or group attitudes and practices. Apart from the need to make a contribution to the reduction of a major public health problem, the home accidents project has shown local communities the value of self-help in health matters and has led to the formation of volunteer health education committees in local country areas.

A complete report on the Corrigin Project and subsequent developments will be published shortly.

Establishment of a State-wide system of local committees, formed as a result of a community experience in self-help, has been made a major project. The Infant Health Service has become actively interested in stimulating home accident projects, and an increase in activities may be expected. Infant Health nurses are an already-accepted point of entry into local areas, where, in the majority of cases, they enjoy the trust and confidence of the people. This process will be relatively slow, but should in the long run be more effective than complete reliance on mass propaganda.

Other problems included in the Five Year Plan to which the Council is working, and on which work has been done include Fly Control, Immunisation, Coughs and Sneezes, Care of the Feet, Food Handling and Holiday Safety and Hygiene.

A good deal of time has necessarily been spent in study and research, and in developing good public relations. The work of the Librarian, Department of Public Health, in providing text-books and source material on a wide variety of problems affecting the Council has been of a high order. Indeed, without this essential service the Council's understanding of many aspects of public health education could not have been developed in such a relatively short time. The co-operation and interest of Press and radio interests, particularly the Federation of Commercial Broadcasting Stations (W.A. Division) in stimulating public support for the Council has been outstanding.

The development of efficient teaching aids for use at primary and secondary levels has been undertaken in co-operation with health education staff at both Teacher Training Colleges.

J. T. CARR, Executive Officer,
Health Education Council of Western Australia.

Appendix XXIII

INCIDENCE AND MORTALITY OF NOTIFIABLE INFECTIOUS DISEASES

Diseases Notifiable.	1954.			1955.			1956.			1957.		
	Cases Re-ported.	Amended Diag-nosis.	Deaths.	Cases Re-ported.	Amended Diag-nosis.	Deaths.	Cases Re-ported.	Amended Diag-nosis.	Deaths.	Cases Re-ported.	Amended Diag-nosis.	Deaths.
Acute Rheumatism	60	60	(B) 8	39	39	(B) 8	21	21	(B) 3	27	27	(B) 4
Amoebiasis	8	8	....	2	2	1	7	7	....	4	4	....
Ankylostomiasis	2	2	....	1	1	1	1	1	1	....	....	....
Brucellosis	8	8	....	5	5	....	3	3	....	2	2	....
Chorea	6	6	....	4	4	....	1	1	....	1	1	....
Dengue Fever	2	2	....	....	....	....	....	....	....	....	....	....
Diphtheria	127	119	3	547	480	6	159	145	1	66	63	1
Dysentery (Amoebic)	6	6	1	7	7	1	9	9	1	6	6	....
Dysentery (Bacillary)	42	42	1	127	127	....	71	71	3	46	46	....
Encephalitis, Lethargic	....	....	3	....	....	1	2	2	1	2	2	1
Erythema Nodosum	1	1	....	....	....	....	1	1	....	1	1	....
Hydatid	....	....	1	1	1	1	....	....	1	....	....	1
Infantile Diarrhoea	29	29	(A) 22	30	30	9	48	48	8	23	23	13
Infective Hepatitis	166	165	4	254	254	7	181	181	4	363	363	3
Lead Poisoning	2	2	....	3	3	....	13	13	1	1	1	....
Leprosy	47	47	....	29	29	....	34	34	....	33	33	....
Malaria	29	29	1	5	5	....	6	6	....	2	2	....
Meningococcal Infection	48	48	3	13	13	4	13	13	2	6	6	5
Paratyphoid	1	1	....	4	4	....	....	....	....	3	3	1
Poliomyelitis	450	436	4	34	33	1	416	401	15	9	3	1
Pleural Effusion	4	4	1	12	12	....	5	5	1	6	5	1
Puerperal Fever	2	2	....	5	5	....	1	1	....	2	2	....
Purulent Ophthalmia	52	52	....	35	35	....	31	31	....	9	9	....
Rubella	627	627	....	227	227	....	85	85	....	550	550	....
Salmonella Infection	32	32	1	58	58	....	27	27	....	21	21	1
Scarlet Fever	92	91	....	69	68	1	57	57	....	120	120	....
Tetanus	4	4*	8	9	9	5	15	15	10	4	4	3
Tetanus Neonatorium	....	....	....	....	....	....	1	1	....	....	....	....
Trachoma	3,686	3,686	....	1,470	1,470	....	280	280	....	656	656	....
P.T.B.	368	344	57	408	401	31	429	419	43	347	327	35
Other T.B.	26	34	4	39	39	2	43	44	3	32	32	1
Typhoid Fever	12	12	1	13	13	1	8	8	....	9	9	....
Typhus Fever	19	19	....	22	22	1	16	16	....	7	7	....

Deaths exclude Full-blood Aborigines.

(A) Gastro-enteritis and Colitis (except ulceration) under two years and diarrhoea of newborn.

(B) Rheumatic Fever.

* Notification incomplete.

Appendix XXIV

MATERNAL MORTALITY

Period.	Average Live Births.	Average Maternal Deaths.	Average Rate.
1901–1905	6,681	28·0	4·19
1906–1910	7,691	43·4	5·64
1911–1915	8,844	39·4	4·46
1916–1920	7,726	41·4	5·36
1921–1925	8,056	34·2	4·25
1926–1930	8,748	46·8	5·35
1931–1935	8,062	35·4	4·39
1936–1940	8,877	32·4	3·65
1941–1945	10,408	24·4	2·34
1946–1950	13,130	21·4	1·63
1951–1955	15,724	13·8	0·88

Year.	Live Births.	Deaths From.									
		Puerperal Septicaemia.		Other Puerperal Infections.		Abortion.		All other Complications of Pregnancy and of the Puerperal State.		All Complications of Pregnancy and the Puerperal State.	
		No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
1943	10,481	2	0·19	1	0·10	3	0·29	17	1·62	23	2·19
1944	10,870	2	0·18	2	0·18	5	0·46	18	1·66	27	2·48
1945	10,672	....	....	2	0·19	5	0·47	13	1·22	20	1·87
1946	12,105	....	....	3	0·25	5	0·41	18	1·49	26	2·15
1947	12,874	1	0·08	1	0·08	8	0·62	22	1·71	32	2·49
1948	12,981	2	0·15	4	0·31	1	0·08	13	1·00	20	1·55
1949	13,511	....	....	2	0·15	3	0·22	11	0·81	16	1·18
1950	14,228	....	....	2	0·14	1	0·07	12	0·84	13	0·91
1951	14,794	....	....	2	0·14	3	0·20	11	0·74	16	1·08
1952	15,413	....	....	3	0·19	3	0·19	12	0·78	18	1·17
1953	15,862	....	....	....	....	1	0·06	8	0·50	9	0·57
1954	15,928	....	....	....	....	5	0·31	7	0·44	12	0·75
1955	16,623	....	....	....	....	1	0·06	13	0·78	14	0·84
1956	16,916	....	....	....	....	2	0·12	7	0·41	9	0·53
1957	16,924	....	....	....	....	3	0·18	8	0·47	11	0·65

All rates per thousand live births.

Appendix XXV

STILLBIRTH AND INFANT MORTALITY RATES

Year.	Total Births including Stillbirths.	Stillbirth Rates.	Neo-Natal Rates.		Total Mortality Rates under One Year.	Other Post Natal Rates Over One Month and Under One Year.
			Under One Week.	Under One Month.		
1926	8,534	27·4	....	27·6	48·0	20·4
1927	8,708	26·0	....	23·0	44·7	21·7
1928	8,981	30·9	....	23·1	35·5	12·4
1929	9,316	28·4	18·8	25·8	54·6	28·8
1930	9,456	27·0	18·0	23·5	46·5	23·0
1931	8,777	26·0	20·1	26·6	40·5	13·9
1932	8,175	25·7	21·02	25·2	43·5	18·3
1933	8,105	29·4	18·1	22·5	35·8	13·3
1934	8,029	29·2	19·3	24·8	38·8	14·0
1935	8,377	30·8	20·6	24·8	39·0	14·2
1936	8,730	28·9	19·6	24·8	41·0	16·2
1937	8,850	27·2	16·8	21·2	36·5	15·3
1938	9,325	23·9	16·6	19·1	33·1	14·0
1939	9,249	23·0	16·5	19·7	40·0	20·3
1940	9,363	25·9	20·5	24·9	43·0	18·1
1941	10,375	24·6	15·1	18·1	34·4	15·7
1942	10,109	20·6	17·1	20·3	36·2	15·9
1943	10,759	25·8	17·1	21·0	31·8	10·8
1944	11,144	24·8	18·6	21·0	32·0	11·0
1945	10,896	20·6	18·0	20·0	28·9	8·9
1946	12,398	23·1	17·1	20·6	30·3	9·6
1947	13,178	23·2	16·9	19·4	30·2	13·2
1948	13,197	20·5	16·9	18·7	25·0	8·4
1949	13,779	19·4	16·2	19·0	25·9	6·8
1950	14,468	16·6	16·2	18·0	26·7	8·6
1951	15,091	19·7	16·2	19·7	28·2	8·5
1952	15,697	18·1	15·5	17·7	24·5	6·8
1953	16,130	16·6	13·4	16·2	23·4	7·3
1954	16,198	16·7	14·2	15·8	22·2	6·4
1955	16,862	14·2	13·3	15·8	22·1	6·3
1956	17,142	13·2	13·0	15·7	22·4	6·7
1957	17,169	14·3	13·6	14·9	20·8	5·9

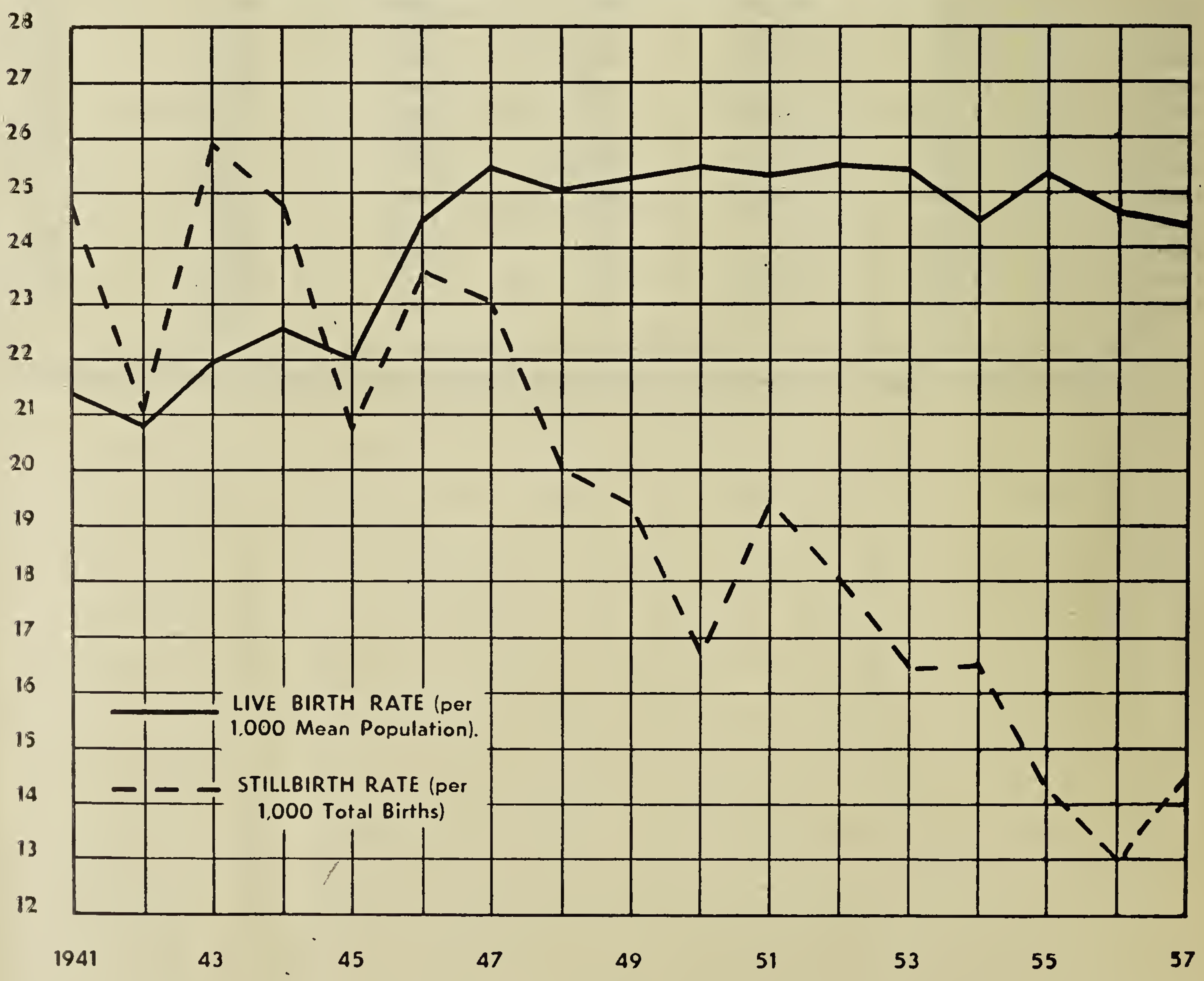
In above table all rates are calculated in deaths per 1,000 of total births, including stillbirths.

Appendix XXVI

WESTERN AUSTRALIA – STILLBIRTH AND BIRTH RATES

Year.	Mean Population.	Live Births.		Still Births.	
		Number.	Rate per 1,000 Mean Population.	Number.	Rate per 1,000 Total Births.
1941	473,968	10,118	21·35	257	24·77
1942	476,619	9,901	20·77	208	20·57
1943	476,745	10,481	21·98	278	25·84
1944	481,498	10,870	22·58	274	24·59
1945	487,510	10,672	21·89	224	20·56
1946	492,771	12,105	24·57	293	23·63
1947	502,951	12,874	25·60	304	23·07
1948	514,621	12,931	25·13	266	20·16
1949	532,603	13,511	25·37	268	19·45
1950	557,878	14,228	25·50	240	16·59
1951	580,317	14,794	25·49	297	19·68
1952	600,615	15,413	25·66	284	18·09
1953	621,034	15,862	25·54	268	16·62
1954	640,140	15,928	24·88	270	16·67
1955	658,747	16,623	25·23	239	14·17
1956	677,317	16,916	24·98	226	13·18
1957	691,723	16,924	24·47	245	14·27

WESTERN AUSTRALIA – LIVE BIRTH AND STILLBIRTH RATES



Appendix XXVII

MEAT INSPECTION FOR YEAR ENDED 31st DECEMBER, 1957

Number and Type of Animals Slaughtered		Carcasses Condemned for—								Part Carcasses Condemned for—					Organs Condemned for—				
		Tuberculosis	Actinomycosis	Piroplasmosis	Pleuro-Pneumonia	Caseous Lymphadenitis	Paratyphoid	Traumatic and Septic Conditions	Other Abnormalities	Actinomycosis	Caseous Lymphadenitis	Tuberculosis	Arthritis	Other Abnormalities	Actinomycosis	Echinococcosis	Pleuro-Pneumonia	Tuberculosis	Other Abnormalities
Robb's Jetty (including Watson's)																			
Cattle	20,939	33	....	57	....	....	....	38	610	170	....	87	....	535	....	....	....	....	49,519
Calves	41	....	....	....	....	....	....	....		....	....	....	....		....	90	....	2	
Sheep	226,916	....	....	....	....	15	....	104		....	345	....	301		....	....	....	....	
Pigs	97,974	71	....	....	....	....	30	59		....	....	2,389	93		....	....	....	....	
Midland Junction (including Foggitt's)																			
Cattle	59,634	105	....	114	....	....	....	79	2,700	606	....	113	....	303	....	....	....	....	42,461
Calves	4,824	....	....	....	....	....	....	....		....	....	....	....		....	....	....	104	
Sheep	590,798	....	....	....	....	30	....	426		....	626	....	598		....	....	....	....	
Pigs	48,607	55	....	....	....	....	58	29		....	....	96	44		....	....	....	....	
Kalgoorlie																			
Cattle	3,734	1	....	....	....	....	....	....	24	26	....	12	....	17	....	....	....	....	1,625
Calves	....	....	....	....	....	....	....	....		....	....	....	....		....	....	....	....	
Sheep	36,790	....	....	....	....	....	....	10		....	22	....	3		....	....	....	....	
Pigs	1,804	....	....	....	....	....	....	....		....	....	13	....		....	....	....	....	
Perth Meat Markets																			
Cattle	2,031	....	....	....	....	....	....	1	254	1	....	....	....	32	....	....	....	....	79
Calves	23,886	....	....	....	....	....	....	....		....	....	....	....		....	....	....	....	
Sheep	2,127	....	....	....	....	....	....	....		....	....	....	....		....	....	....	....	
Pigs	1,570	1	....	....	....	....	....	....		....	....	5	....		....	....	....	....	
Fremantle Meat Markets																			
Cattle	373	....	....	....	....	....	....	....	3	....	....	....	....	8	....	....	....	....	2
Calves	1,884	....	....	....	....	....	....	....		....	....	....	....		....	....	....	....	
Sheep	410	....	....	....	....	....	....	....		....	2	....	....		....	....	....	....	
Pigs	110	....	....	....	....	....	1	....		....	....	1	....		....	....	....	....	
Country Districts—Albany, Bunbury, Busselton, Collie, Geraldton, Harvey, Katanning, Manjimup, Narrogin and Northam																			
Cattle	20,986	26	....	....	....	....	....	7	714	129	....	26	....	94	....	....	....	30	6,718
Calves	5,098	....	....	....	....	....	....	....		....	....	....	....		....	....	....	....	
Sheep	158,785	....	....	....	....	22	....	25		....	67	....	96		....	....	....	....	
Pigs	9,737	11	....	....	....	....	6	20		....	....	37	2		....	....	....	32	
Totals, Cattle	107,697																		
Calves	35,733																		
Sheep	1,015,826																		
Pigs	159,802																		

Appendix XXVIII

REVENUE AND EXPENDITURE FOR THE YEAR 1957

REVENUE

	£	s.	d.
Licence Fees	33	15	0
Meat Inspection Fees	18,075	13	4
Fish Inspection Fees	477	7	10
Pathological Laboratory	3,869	16	3
Sanitation Refunds	4	10	0
Inspection of Plans (Septic Tanks)	15,975	10	10
Miscellaneous	1,614	1	6
Nurses and Midwives Registration and Examination Fees	2,121	15	5
T.B. Diagnosis (Generally)	485,895	9	9
T.B. Diagnosis (Wooroloo)	36,513	9	9
Health Supervision Charges	691	10	1
Baby Patterns	19	18	0
Hospital Benefits—Lepers	417	12	0
Supplementary and Organisation Benefits—Lepers	107	12	0
Poliomyelitis After Care	884	6	0
Immunised Diphtheria	492	2	0
Infectious Diseases	3,561	9	0
Pesticide Registration	166	3	10
	£570,922	2	7

EXPENDITURE

Salaries (including Tuberculosis)	482,368	8	1
Infectious Diseases	15,131	7	5
School Medical and Dental Services	24,900	14	7
School Medical Doctors and Nurses Travelling	2,830	7	4
Dental Bursaries	4,355	17	5
School Dentists Travelling and Expenses	5,967	6	2
Travelling and Transport Generally	2,388	17	1
Travelling and Transport Commissioner and Medical Officer	1,061	13	6
Ophthalmic Survey	3,096	4	8
Postage and Telephones	1,103	14	1
Laboratory	12,380	17	8
Venereal Diseases	3,790	18	6
Infant Welfare Centres	69,995	17	6
Maintenance and Transport Lepers	26,073	3	1
Poliomyelitis	59,321	9	0
Sanitation Government Buildings	16,165	14	3
Health Education	3,437	6	7
Tuberculosis Clinics	253,364	16	1
Miscellaneous	24,289	0	8
	£1,012,023	13	9

20415/11/58—760

By Authority: ALEX. B. DAVIES, Government Printer, Perth